THE BUILDER

A Journal for the Architect & Constructor

APRIL 13, 1928 — No. 4445

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86TH YEAR

Lloyds, Leadenhall Street, E.C.: Detail of Entrance.

SIR EDWIN COOPER, Architect.

THE BUILDER

A JOURNAL FOR THE ARCHITECT AND CONSTRUCTOR

WITH WHICH IS INCORPORATED "THE BRITISH ARCHITECT."

VOL. CXXXIV. No. 4445. APRIL 13, 1928.

SKYSCRAPERS

IT has been said by someone that there are two kinds of people—those who dislike skyscrapers and those who are financially interested in them. As a wide generalisation it is probably true that the conflict between material and sentimental forces represents a fairly accurate summing up of the position.

It may be that the advocates of the skyscraper make the mistake of resting their claims solely upon a practical basis, while their opponents take full advantage of the thin border line that divides sentiment from sentimentality. There is, in essence, a conflict between architecture and life—or rather the ideal life. The great illusion, we are told, of the typical British nineteenth-century painter was that the subject of a picture was what mattered most. In this twentieth century our young painters tend to go to the opposite extreme, to hold subject as of no importance, and to think that handling and technique are all that matter in art. Both of these may be illusions peculiar to representative art, but after all they are not really serious or dangerous. This analogy applied to architecture as a functional art (we can think of no better word) reveals at once the fundamental attitude of architecture in its expression of the good life and the good state. Fine architecture, in the absolute sense, can hardly be conceived where it is at loggerheads both with its subject and the populace, and from this point of view it seems to us that the skyscraper, whether we agree or not with its purpose or object, is capable of developing conditions that can be anti-social.

For many years we were unwilling to assume that there was anything fundamentally racial in the skyscraper form of building. It seemed to us that structural steel and the passenger elevator were the inventions that made the skyscraper possible, and that America had developed, or exploited, these inventions. We had not regarded height, *per se*, in building as a racial characteristic comparable with the architectural developments of older countries. Therein we begin to think we may be wrong. The significance of architecture born of structural steel and the elevator developed to their logical conclusions may be as fundamental as that associated with the post and beam and the arch. There is, however, an important distinction to be made. It is a platitude to say that certain results are possible with certain materials, but it carries with it the implication that everyone desires these results. Consequently if the desire for the skyscraper is peculiar to the American mind, it is in that sense a racial architecture.

The symbolism of the skyscraper is as trans-Atlantic as "Babbit," the immortal creation of Mr. Sinclair Lewis. He shows us the booster, the dealer in real property or, as he would like to term himself professionally, the "realtor." As a type he is, in his own jargon, "too busy to allow his hairdresser to shave upwards." Frankly, we do not like the type. We had much experience during the war of rush and bustle methods that were not the result of clear and rapid thinking. They were merely the sign-manual of inefficiency, and an effective disguise for the incompetent. This particular stock has suffered a slump during recent years, and to-day we are not convinced that fifteen minutes saved in the walk to a neighbour's office represents fifteen minutes' worth of additional work at the end of the day. If our diagnosis is wrong and our time is so very precious that we must seize every minute of our nervous energy, we are at the stage when technical efficiency in business is the dominating factor in our city lives. We are not submitting a considered opinion upon the intrinsic value of American efficiency (we are not in a position to offer it), but we have it on the authority of Mr. J. A. Spender, that money-making—or the development of the country as some people prefer to call it—is undoubtedly one of the most respected industries in America. Our point is whether we desire this outlook upon life.

The problem of the skyscraper, in essence, brings up the quarrel between moneymaking—or efficiency as it is euphemistically termed—and the social state. As always the question arises in money-making whether the activities associated with it are wholly beneficial. There is a price to be paid for abnormal energy, just as there is for efficiency under abnormal conditions, but the penalty is not always fairly adjusted. All human activities can be grouped into the categories of social and anti-social. We care not what sacrifices a man may be prepared to make to achieve a money-spinning career; we do care a very great deal that the consequences shall not fall upon those who have neither these ambitions, nor in fact any interest in his traffic.

There are many, we suppose, who desire to be near to the hub of the city, and when we all think along these lines the hub develops into something which is more than a centre. When we congest business, electric light takes the place of sunlight, and subways take the place of open thoroughfares. We are fully aware that the word skyscraper is not a fair definition of the degree of height in building. To double the width of a thoroughfare for the purpose of doubling the height of the buildings represents, within a small margin of error, a mathematical alteration that leaves the area of a city very much as it was. This is not our conception of the dangers of the skyscraper. We have in mind the big city distributed over a large area, and the big city concentrated on a small area. For the first there may not be a great deal to be said, but for the second we seem to remember that Mr. Lewis Mumford, in his book "Sticks and Stones," presented a dreary picture of the millions who fill the pavements.

What seems to us a fundamental social danger associated with the skyscraper is the impetus given to land values. The moment a tall building is erected the "Babbits" are hot on the scent, and in their jargon "the roof's the limit." Land is parcelled out by the foot when potential values are measured by the height of the proposed building. In this way the skyscraper creates its own land values, and incidentally its own necessity. It is the prevailing impression, we believe, that an additional number of stories is one method of reducing the site value in terms of floor area. We have never attempted to examine carefully this theory in terms of building costs, but we submit an obvious elementary impression that as weights must be carried to their foundations, the costs per floor must increase with the height. It would be a startling revelation if it were proved that height in a building was an added financial burden instead of a means of reducing the cost ratio of the land. Beyond a certain point it seems conceivable that the cost of crowding by height upon a limited area is an expensive and even hopeless method of attempting to reduce land values which by the irony of fate the high building has created. On the purely financial side the skyscraper seems to place a heavier burden upon commerce than it removes. And the financial side is probably the least of the penalties.

It is important at the present time, when commerce has been so severely depressed, that adventitious aids to efficiency should not be mistaken as the shadow for the substance. We have undertaken the great task of clearing out the slums, and conditions in our factories have been improved out of all recognition during the last half-century. Lagging behind, and excluded from the provisions of the Factories Act, is the office worker in the newest city building. As we write we see that this matter has just been raised in Parliament. Some time in the future it may be essential to have higher buildings as we widen our streets, but we sincerely hope that it will be a criminal offence to destroy both the physical health and the soul of a people.

NOTES

Our Leader

In our leader we raise the doubt whether the sky-scraper—apart from the serious question ot land-values—is an economic asset to business. We are not aware that this matter has ever been discussed in terms of costs, but we think it is of sufficient importance to demand careful analysis. Hitherto too much has been taken for granted, and words like *bigness* and *efficiency* have no real connection with mathematical building knowledge.

Building Costs

An elementary knowledge of mathematics teaches us that though the weight of a story—say on the tenth floor—is an additional burden to nine lower floors, the cost is not nine times greater. But there must be an additional cost per floor, probably in a decreasing ratio, and a considerable extra cost for the carrying of walls that in height have exceeded their crushing factor of safety. Although in our opinion the financial question is of infinitely less importance than that of light and air, it is of importance if we are trying to save thirty minutes a day by crowding together that we should know the price we have paid for these minutes. It would be a pleasant discovery for some of us if we were told that we were better as we were; that our time was not valuable enough to cover the extra cost of housing us in a skyscraper. Flesh and blood have their claims, but even if we are inclined sometimes to forget them, and become obsessed with the word efficiency, we are still sensible enough to question it where the cost is heavy and the result doubtful.

Civilisation

If we are to judge the sky-scraper from a sociological point of view we must regard it as a trans-Atlantic development. Civilisation, we are told, has moved from East to West, but it is extremely doubtful if it begins to return to the East when we accept the skyscraper idea from America. A great deal of American literature is beginning to be read in this country, and it is much more valuable in helping us to form impressions of that nation than a casual trip that brings us into contact with externals. Impressions of a few weeks' visit we have in abundance. It is the soul of a people, its outlook, its ambition, and incidentally its health that we should seek to study, before we copy its developments, that, so far as we know, may be already outworn.

The Country-side.

Many whose good fortune it was to travel over our beautiful countryside during the sunny days of this Easter holiday will have felt anew the keen regret which the constantly increasing spoliation of the country raises in their minds. It seems so unnecessary and wrong that anyone should be allowed to spoil the amenity and beauty of our fair land by the erection of ugly houses and sheds. Our local authorities ought surely to realise that they have a duty to their own neighbourhood in the prevention of eyesores. Why should it be possible for a firm of car owners to erect a hideous shed in the very centre of one of the most beautiful pleasure resorts of the country? Things like this—pumping stations awkwardly placed, and ugly cottages are allowed to interfere with the very charm which is the magnet of so many of our well-known attractive villages and towns.

The Spread of Ugliness.

We are glad that Mr. Guy Dawber has again raised an appeal in *The Times* against all this spread of ugliness and disorder. He truly says there is hardly a town or village, at any rate in the Home Counties, that is not disfigured and artistically injured by the erection of commonplace, vulgar buildings which jar with their neighbours and offend the eye. The hideous petrol-filling stations and pumps which are strewn indiscriminately all over the country have become a by-word of reproach. The worst of it is that the simple beauty of our English countryside, which is recognised all over the world, is rapidly passing from us without protest and almost unnoticed, and its charm and character once lost can never be regained. The periodic complaints of those to whom this is a matter of very great importance counts little or nothing. Cannot the Council for the Preservation of Rural England suggest something more than mere protest? Can they not urge local authorities to find powers to stop this terrible defamation?

Lloyds, Leadenhall Street, E.C.: Detail of External Carving.
Sir Edwin Cooper, Architect.

Craftsmanship.

As an attempt to let stone, tools and craftsmen find simple expression we can commend the efforts of Mr. Edwin Smyth, of Sunderland, who has shown us several interesting designs for rustic bowls of solid stone, copper-bound stone tubs and hand-beaten lead linings floated down on cement. We hope Mr. Smyth will meet encouragement in his work. He ought to do a good deal in following out the suggestions of architects, for his craftsmanship is sure to be good.

Quantities in America.

A quantity surveyor who learnt his business in this country has just sent from St. Louis, U.S.A., an interesting account of his success out there. He says "The surveyor in this country sells his quantities to the builder and usually on each job there are as many as five or six quantity survey firms taking off the job and competing in price to sell their take-off to the general contractors. Only the carcase trades are taken off, as the finish and special trades are sub-let by the general contractor, who receives bids for these sub-contractors before making up his main estimate. So the quantity survey profession is in a very different position from its English prototype. They have formed an American Institute of Q.S. and are endeavouring to ameliorate their lot. There is a wonderful opportunity in this country for young estimators who have had a similar training to mine—the work is very easy and less particular than in the old country, and the profits so much greater."

Notices under Landlord and Tenant Act

A difficulty that has arisen under the Landlord and Tenant Act, 1927, in connection with the service of notices was dealt with *ex post facto* by question and answer in the House of Commons on March 27. The difficulty has arisen from the fact that by Section 26 the Act came into force on March 25, which was a Sunday, whereas the Act is very precise as to the times within which notices must be served under Section 4 where compensation is claimed for goodwill, and under Section 5 where a new lease is claimed, and unless service could be made on Sunday claimants would be out of time. The time for making claims is fixed in Section 4, subs. (1) for both purposes, and is (1) In the case of a tenancy terminated by notice, within one month after the service of the notice on the tenant; and (2) in any other case not more than 36 nor less than 12 months before the termination of the tenancy. It is evident that notices could

Relief Carving on Brick Walls of Gates of Ishtar, Babylon.
(*See page* 610.)

not be served on the previous Saturday under an Act that was not then in force, and that unless service on Sunday was good, claimants whose leases expired on Lady Day, 1929, might be held out of time. The reply given by the Home Secretary was not wholly satisfactory. He pointed out that under Section 23 service could be effected in three ways (1) by personal service; (2) by leaving the notice at the last known address; and (3) by registered post, and said that he had been advised that service under the first two of the above methods would be good even though made on a Sunday, but that as regards posting notices the question was not free from doubt, but if it appeared that tenants had been damnified in this respect he was prepared to consider the matter further. This Act only was passed on December 22 when calendars for 1928 were easily to be consulted, and it seems extraordinary that this point should have been overlooked by those responsible for the Act. It seems obvious that many persons may have been damnified, for personal service is by no means easy on a Sunday when many persons are away from their places of business and homes, and few people would resort to the second course and rush about the country serving notices, and thus it is clear that the only "further consideration" required is a short Bill declaring notices served on Monday, 26th, good on this occasion, and defining the date for service in the future.

Piccadilly-Circus.

We must be all agreed that the quadrant end of Regent-street has given us a note of some dignity and distinction which no other London street has achieved. It would be something of the greatest value to London if the same character of design could be repeated round Piccadilly-circus, and it is sincerely to be hoped that the authorities who can exercise some control over the new buildings will make a strenuous effort to bring this about. There have been two or three admirable projects for dealing with this space, and one of the best was that by Mr. John Murray. If his plans for squaring up the frontages were carried out with the building designs of the same character on the quadrant we should have a central area in London in which we might all feel some reasonable satisfaction and pride. It speaks ill for our foresight that leases exist even up to the year 2000 which form definite obstacles to improvements in plan here and in other parts of London, but it will be easier to face these difficulties now than to put it off to an uncertain future.

A Model of the Keep of the Tower of London.

We give on page 610 *The Builder* model of "the White Tower," or the Keep, of the Tower of London represented as in the year 1597. This model has been specially prepared for exhibition at the Building Exhibition, and will be found on *The Builder* Stand No. 231, Row N. The model is of interest, as it makes clear some hitherto obscure points of an architectural character and supplies details, we believe, not to be found elsewhere. The present wide window-openings on the first floor were made in the seventeenth century, probably by Wren. There are no detailed records of the original windows, except that they are represented in ancient drawings as very narrow. On the suggestion of the Chief Inspector of Ancient Monuments (Mr. C. R. Peers, C.B.E., M.A., F.S.A.) the windows and embrasures of the model have been copied from the first floor of Castle Hedingham, a Norman Keep in Essex of slightly later date. The alterations to the windows on the second floor were not made by Wren, but were carried out in the 18th century. An interior elevation of the original embrasures and windows, dated 1721, has been discovered recently, and a series of plans, showing alterations carried out from 1729 to 1754, has only just come to light as a result of our inquiries. From these, a reconstruction of the openings has been effected in the model.

Lloyds, Leadenhall Street, E.C.: Detail of External Carving.
Sir Edwin Cooper, Architect.

GENERAL NEWS

Mr. George Dale Oliver.

We regret to record the death, on April 10, at Carlisle, of Mr. George Dale Oliver, F.R.I.B.A. He was 77 years of age.

An Engineer's Estate.

Mr. Thomas Bernard Hall, M.I.M.E., M.I.C.E. (87), of Beach House, Little Orme, Llandudno, Carnarvon, retired consulting engineer, left £43,954.

Proposed New Technical College, Barnsley.

The Higher Education Sub-Committee has decided that Messrs. Briggs and Thornely, architects, be instructed to proceed with preparation of plans for the proposed new mining and technical college.

Proposed New Theatre at Leicester.

The directors of the Leicester Palace Theatre, Stoll Offices, Coliseum-buildings, W.C.2, propose to pull down Floral Hall and to build a large picture theatre, seating about 2,000 persons. No plans have yet been prepared.

South Devon Hospital, Plymouth, Extensions.

Large extensions, reported to involve an expenditure of £100,000, are to be carried out by the Governors of the South Devon and East Cornwall Hospital, including new wards, administration block, boiler-house, out-patients' dept., etc. The architect is Mr. E. Stanley Hall, F.R.I.B.A., 54, Bedford-square, W.C.

The Essex Ring.

The Essex Ring, recently presented to Westminster Abbey, by Mr. E. S. Makower, is now in its place on the tomb of Queen Elizabeth, and can be seen by visitors. The ring is fixed under glass in a cavity in a small block of marble so placed as not to interfere in any way with the lines of the tomb. Mr. W. Reynolds-Stephens, President of the Royal Society of British Sculptors, was entrusted with the work.

Royal Society of British Sculptors.

At the annual general meeting of the Royal Society of British Sculptors, just held, Mr. W. Reynolds-Stephens was elected president for his eighth year of office. Mr. Alfred Drury, R.A., was elected vice-president, and Mr. C. J. Hartwell, R.A., treasurer. The following were elected Associates of the society:—Mr. Alexr. Carrick, A.R.S.A.; Lady Hilton Young (Lady Scott), Miss Mary Morton and Mrs. A. Lindley-Millican.

Foundling Hospital Site.

Mr. F. W. Hobbs, chairman of the Town-Planning Committee of the London County Council, replying to a question at a recent meeting of the Council as to whether consent had been given to the proposed erection of flats on the Foundling Hospital site, said that the company who had submitted an application had been informed that the Council would be prepared to grant permission on condition that Brunswick-square and Mecklenburg-square were permanently preserved as open spaces. The site to which the application referred was scheduled for residential uses under the Council's town planning scheme.

Thames Preservation Society.

In accordance with decisions reached at the conference held at Reading on July 7 last year, the Council for the Preservation of Rural England convened a meeting to start its Thames Valley branch at the Shire Hall, Reading, last Friday. Lord Astor, who was asked to preside, said that when the first action was taken some months ago the matter was urgent, and it was still more urgent now.

The annual subscription to the Thames Valley Branch is one guinea, and the branch will welcome contributions of any amount from those interested. These should be sent to the secretary, the Council for the Preservation of Rural England, Thames Valley Branch, 33, Bloomsbury-square, London, W.C.1.

COMPETITION NEWS

Competition of Industrial Designs, 1928.

By permission of the Board of Governors of the Imperial Institute, the public exhibition of works sent in for this year's Competition of Industrial Designs will be held in the Exhibition Pavilion of the Imperial Institute, South Kensington, S.W. Full particulars of the Scholarships and prizes offered in connection with the Competition can be obtained from the Secretary of the Royal Society of Arts, Adelphi, W.C.2.

Proposed Open-Air School, Keighley.

The following notice has been issued by the R.I.B.A.:—

"Members of the Royal Institute of British Architects and of its Allied Societies must not take part in the above competition, because the conditions are not in accordance with the published Regulations of the Royal Institute for Architectural Competitions."

MEETINGS

Friday, *April* 13.

Building Trades Exhibition. Opening by the President of the R.I.B.A. At Olympia. (*For other Exhibition fixtures, see page* 647.)

Monday, *April* 16.

Royal Society of Arts. Mr. A. G. Huntley on "Applied Architectural Acoustics." 8 p.m.

Wednesday, *April* 18.

Royal Society of Arts. Mr. Alfred C. Bossom, F.R.I.B.A., on "American Architecture." 8 p.m.

Northern Architectural Association. Mr. A. K. Tasker on "Modern Schools." 7.30.

Liverpool Architectural Society. Mr. E. Prentice Mawson on "Birkenhead Corporation Park Development Scheme."

Thursday, *April* 19.

Institution of Structural Engineers (Yorkshire Branch). Professor J. Husband on "Steel-framed Buildings." 6.45 p.m.

BRICKWORK OF ANTIQUITY

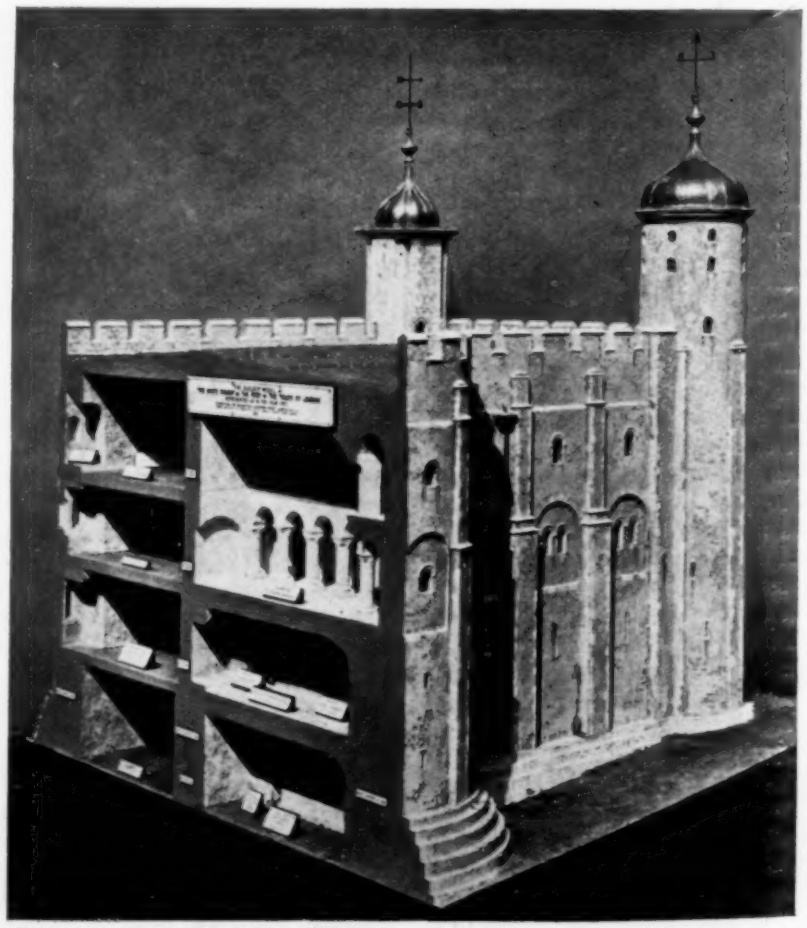
There are to be found to-day buildings made solely of brick which have withstood the tropical heat of five and six thousand years, and these same bricks are still strong, and to all intents and purposes as good as the day they were made. In Mesopotamia the thermometer during the summer months will rise as high as 137 degrees in the shade, yet in the wonderful ruins of Kish and Ur of the Chaldees, where Abraham spent his early years, and where a comparatively high state of civilisation existed 4000 and 3000 B.C., there are remains of temples, palaces, paved streets and courtyards where the brickwork is in perfect condition, with most of the bricks still bearing the signature and dates of kings in whose reign they were made.

It was the custom in those far-off times never to choose a new site, but to build a city on the remains of an old one, and at Ur the excavators have reached the third foundations, where they have found paved streets almost intact, with each brick bearing in clear cipher the date and signature of the builder. These bricks were not composed of some wonderful preservative compound, but were made solely of mud from alluvial deposit, either sun-dried or kiln-baked, and set together with bitumen as mortar.

In the famous Ziggurat, or shrine to the Moon-god, the core of the building is made up of mud, faced round with buttressed walls of kiln-baked bricks, which seem in a far better state of preservation than in many of our oldest buildings in England.

In Thibet, which can boast of very tropical summers, the bricks, which are very large, are all made of mud pressed into shape by hand between boards, and left to bake in the sun, yet they have a wonderful duration, and withstand both the excessive cold of winter, the fierce winds, and the tropical heat of summer.

An interesting example of sculpture in brickwork is shown on page 609.



Shown at the Building Exhibition, Olympia.

"The Builder" Model of "The White Tower," or the Keep of the Tower of London, Represented as in the Year 1597 (*see p.* 609)

CORRESPONDENCE

[While we are glad to publish letters on professional and other matters of interest to our readers, it must be understood that we do not necessarily endorse the remarks of correspondents, who will oblige us if they will express their views as briefly as possible.]

High Buildings and the Purpose of Life.

Sir,—Is there not something sinister about the development of high buildings in our towns? As I see it, this is an extension of building enterprise very much to be deprecated, and no more striking illustration of its terror has been given than that seen in a *Journal* of the R.I.B.A., recently published. Why should these towering masses of building be allowed in Lower New York? What is the ultimate reason for them all? Is it anything but the intensive race for money? It may be a great boon that you can transact your business and feed and sleep within a very small area of the city, so that no moment may be lost in the pursuit of wealth. But is this a life to be desired? And though some occupy an upper floor in one of these skyscrapers and enjoy free air and prospect, what about the conditions of existence in all the 20 or 30 floors below you, and in the crowded, darkened streets? Of course, we may elevate the foot pavements, and we may build our walls of glass, provide good artificial and comparatively free circulation of air by costly mechanical means, and we may get gradually acclimatised to the lower-level life in such a city, like ponies in a coal-pit; but is such a life the desirable goal for human beings? Is it not time that the millions of toiling humanity who help to build up the wealth of the few took steps to put some reasonable curb on the pursuit of the almighty dollar? It may not be the mission of papers like *The Builder* to protest against any reasonable ways for the pursuit of wealth, but it surely has a distinct duty to humanity to protest against the development of building which tends to convert great cities into mere rabbit warrens. There can be no doubt that the largest number of our population are aiming to get the best out of life by following false gods. The way to get the best out of life is not a mere feverish rush for money or position, but to live in the pleasantest and healthiest surroundings possible, so that each day, as it passes, may bring some element of joy and comfort. But crowded communities, pleasure houses, and feverish activities seem to make the strongest appeal to the masses, many, indeed, of whom might secure some of the better pleasures of existence of this kind in more or less rural surroundings. Can we doubt that an architect earning two or three thousand a year, and spending it all in expenses, would be happier if leading a simpler life? You reply, No; because he is agreeably occupied and has always a sort of chance of better things ahead. Alas! how seldom this comes about. Our agriculture might be a flourishing industry—as it ought—if the masses of our working men had better ideals of life, for they would eschew the meretricious pleasures of crowded town life for the sake of a simpler life spent in the healthy conditions of a rural locale. Surely the whole world is sadly lacking in the knowledge of how to live a sane and healthy life, and those who permit or encourage high buildings are amongst the worst exponents of the rewards of life.

A.R.I.B.A.

"Architects and Decorators."

Sir,—I am glad that in my reply in your issue of January 20, I was able to show "Anglia" another point of view, as he did not at first make his meaning clear on one or two points, and I thank him for explaining that he had in mind "village master painters"; in the first letter he wrote "a village house painter may produce most satisfactory results, etc."—so may any ordinary London or Provincial house painter, but he frequently does not, and cannot unless he is a first-class craftsman.

Your correspondent writes on the assumption that all architects are capable of creating or taking control of decorative work, and that no decorators have any architectural knowledge or instincts. "Anglia" contradicts the first point in his reference to the Owen Jones Scholarship in his letter of January 20, and I quite agree with his statement also in that letter "that many decorators are ignorant of styles"—"that it is no uncommon thing to see a Renaissance scheme of decoration in a Gothic church, and vice-versa."

Your correspondent does not seem to know or to realise that all real decorators have considerable architectural knowledge, and must have, to produce correct schemes; nor does he seem to know that there are hundreds of architects who have very little or no idea of decoration, and that although an architect may be "competent to take his place on the scaffold" he is not fully qualified to supervise decorative work if not capable of creating a decorative scheme.

Your correspondent is evidently strongly opposed to the Incorporated Institute of British Decorators' new scheme of University teaching, although the Professors of Architecture (all architects) at the three Universities approached have welcomed the scheme whole-heartedly; I feel that your correspondent requires further enlightenment on this subject.

I quite agree that "what we want is craftsmen," but all craftsmen cannot become master decorators. Our Institute is doing great work in regard to training and producing first-class craftsmen, and I maintain that art schools and technical schools are not able to supply *all* the education necessary for training decorators (at any rate master decorators) of the standard the Institute is aiming at.

Our Institute has the training of craftsmen so much at heart that I am most grateful for the scheme suggested in the latter part of "Anglia's" letter. I will certainly commend it to our Institute, and gladly accept his kind offer to supply me with a list and description of the best work in East Anglia. We are hoping to extend our scholarships as fast as possible, and I welcome the suggestion that some should be for the purpose of six months' study in East Anglia.

I appreciate your correspondent's criticism, and should be glad to have the opportunity of meeting him, when we could discuss the possibility of "finding a remedy for the present chaotic conditions."

Godfrey Giles,
President, The Incorporated Institute of British Decorators.

SOCIETIES AND INSTITUTIONS

DEVON AND CORNWALL ARCHITECTURAL SOCIETY.

The annual meeting of this Society was held on March 31 at the Duke of Cornwall Hotel, Plymouth. The chair was taken by the President, Mr. A. C. A. Norman, F.R.I.B.A., of Plymouth, other members present being:—The Exeter Branch: Messrs. J. Bennett, L.R.I.B.A., R. M. Challice, E. Kemeys-Jenkin, L.R.I.B.A., A. H. Ough, F.R.I.B.A., O. Ralling, L.R.I.B.A., H. E. Robertson, W. J. M. Thomasson, A.R.I.B.A., L. F. Tonar, L.R.I.B.A., D. W. Cooper, H. Alban Peters, A.R.I.B.A., and J. Challice, A.R.I.B.A. (hon. secretary). The Plymouth Branch: Messrs. Chas. Cheverton, F.R.I.B.A., A. S. Parker, F.R.I.B.A., H. Victor Prigg, A.M.I.C.E., B. Priestley Shires, F.R.I.B.A., W. A. Vercoe, A.R.I.B.A., A. C. Harris, L.R.I.B.A., A. T. Martindale, L.R.I.B.A., W. J. H. Dungey, E. C. Hicks, F. S. Hodge and J. H. Serpell.

The annual report and balance sheet were presented and unanimously adopted. The president drew special attention to that portion of the report relating to the hon. treasurer, Mr. S. Dobell, who had completed 21 years in that office. He informed the members that Mr. Dobell had consented to accept a gift from the society in recognition of his valuable service and that the presentation would be made shortly. The speaker also referred to the valued services of Mr. B. Priestley Shires, who, in addition to his work as hon. secretary to the Plymouth Branch, had consented to act as representative of the Society on the Council of the R.I.B.A. The prize for the annual measured drawings competition of the Society was presented to Mr. W. J. H. Dungey, of Plymouth, the president warmly congratulating him.

Mr. A. C. Norman, the retiring president, then delivered his address, in the course of which, after referring to the continued increase in membership, he said he hoped and believed that their Cornish friends, instead of each blowing a trumpet in his respective corner, would eventually emerge from their fastnesses to help in forming a solid phalanx. Referring to the Registration Bill, he would refrain from comment, except to say that they should be very careful that the recent foreign wedges driven into the ancient oak of the Institute did not at last cause disintegration. They had a right, however, to expect some support from Members of Parliament, who before long would be touring their constituencies. Shortly the proposed Form of Building Contract would be submitted to the Allied Societies for consideration and report, together with an abridged form of contract for small works, such as had been used for a considerable time in government departments. The question of inserting a clause in regard to possible differences with reference to the quality of materials between architect and contractor to be submitted to an arbiter would have to be carefully considered before any departure was made from the contract form of 1909, which might unduly weaken established custom and precedent, and cause extra expense to the owner or client. After all, if a contractor should be lacking in confidence as to the architect, or objecting to the conditions in any respect, he had the alternative of refusing to tender.

A hearty vote of thanks was accorded Mr. Norman for his valuable work and untiring devotion to the Society during his year of office.

The following officers and Members of Council were elected for the ensuing year:—

President: Mr. R. M. Challice, Exeter.

Vice-President: Mr. W. A. Vercoe, A.R.I.B.A., Plymouth; Mr. J. Bennett, L.R.I.B.A., Exeter.

Past President: Mr. A. C. A. Norman, F.R.I.B.A., Plymouth.

Hon. Treasurer: Mr. S. Dobell, Exeter.

Hon. Auditor: Mr. L. F. Toner, L.R.I.B.A., Exeter.

Hon. Secretary: Mr. J. Challice, A.R.I.B.A., Exeter.

Members of Council: Messrs. P. Morris, F.R.I.B.A., E. Kemeys Jenkin, L.R.I.B.A., W. J. M. Thomasson, A.R.I.B.A., F. W. Beech, A.R.I.B.A. (Exeter), J. C. Beare, A.R.I.B.A. (Newton Abbot), A. H. Ough, F.R.I.B.A. (Dawlish), A. S. Parker, F.R.I.B.A., B. Priestley Shires, F.R.I.B.A., C. Cheverton, F.R.I.B.A., J. Leighton Fouracre, F.R.I.B.A., H. Victor Prigg, A.M.I.C.E. (Plymouth).

Associate Members of Council: D. W. Cooper (Exeter), A. T. Martindale, L.R.I.B.A. (Plymouth).

The retiring president offered his congratulations to Mr. R. M. Challice on being elected president, and Mr. Challice thanked the members for the honour they had accorded him.

Following the business of the meeting, there was considerable discussion on the proposed New Form of Contract which had been sent the Society for their observations by the R.I.B.A.

Institution of Structural Engineers: Dorman-Long Travelling Scholarship.

The Institution of Structural Engineers is this year presenting the above-named Travelling Scholarship, value £300 and Gold Medal. The Scholarship is awarded for a competition in the design of a steel-frame structure. All members (in any class) of the Institution are eligible to compete. The closing date for entries is May 7. A syllabus and full particulars may be obtained from Mr. Maurice G. Kiddy, Secretary, 10, Upper Belgrave-street, S.W.1.

THE REPAIR OF ANCIENT BUILDINGS—XV

By A. R. POWYS, A.R.I.B.A.

TREATMENT OF SURFACE DECAY IN STONE, AND AS TO DAMP-PROOF COURSES

—(*Continued.*)

Chemical Preservatives.

It has already been said that surface decay in stone is caused by so great a variety of conditions as to make it impossible to find any single preservative that can always be relied on.

Of recent years much close study has been given to the subject by such men as Mr. Noël Heaton, Mr. Warnes, and Professor Laurie, and it is likely that through their experience the main principles of this science will before long be understood and useful treatments be discovered. No attempt is made to describe the proprietary liquids here. When first quarried stone contains moisture known as "quarry sap," that is the natural moisture in the stone. In this condition the stone is worked. The "quarry sap" makes its way to the surface and dries out. As it dries, it deposits near the surface, in the form of crystals, the natural cementing material of the stone, which in dilute form it carried with it. Thus an outer hard skin or face is formed on the stone, which withstands weather for a long time. When this skin is broken or decayed, the rain-carried agents of decay attacks and disintegrates with increased speed the inner stone; more of the outer face is "blown off," or undermined, and decay is in full swing.

With regard to the theory of decay due to bacteria, the reader cannot do better than refer to the treatise, "Suggestions for the Prevention of the Decay of Building Stone," by Mr. J. E. Marsh, which deals with this difficult subject. But while reading this, he should bear in mind that Mr. Marsh's conclusions are not accepted by chemists without question or doubt. Mr. Warnes, for instance, while he thinks the suggestion should receive careful consideration, indicates that other sources exist which will explain the presence of the nitrates which Mr. Marsh holds indicate bacterial action or "life."

Mr. W. A. Forsyth has observed that where rain falling from the surface of copper runs over stone there is no decay. And from this he suggests that a preservative made from copper in solution would be useful. He recommends copper as the covering of cornices and like projections, rather than lead for the same reason.

The Ancient Monuments Department of H.M.O.W. has given the subject much attention, but as yet has not intimated that it is satisfied with any of the preservative liquids made by the chemists.

My own experience makes me, as already stated, shy of chemical treatment at present. The results obtained make one hopeful, but until the preservatives recommended have been tested over many years and proved efficient, it is very doubtful whether they should be used otherwise than experimentally and on but small areas of ancient stonework. And when this is done a complete record of the work should be kept with the survey. Such points as the temperature of the stone at the time of application, the amounts of moisture it contained, the exact nature of the preservative should all be noted. And together with this, "close-up" photographs before treatment, immediately afterwards, and one at least in each succeeding year should be taken and filed. Such information would be invaluable to those who are studying the subject.

Iron Set in Stone.

Much damage is done to stonework by the presence of iron set into it. In the old days iron was used as cramps to bind stone to stone, being set either in the bed joints or on the surface. Similarly the ends of window bars are commonly found to have split the mullions and jambs. Iron when it rusts expands with irresistible force and breaks asunder the masonry in which it is set. There is no need to go far in order to see this. In most streets where there are iron rails set in stone, the kerbs will be found to have split. It is this quality in iron and steel which causes a number of architects and some engineers to doubt the durability of concrete reinforced with iron, unless iron is surrounded by an impervious material; they hold that concrete is insufficient protection. It is then a safe rule always to remove it from stonework and to substitute for it copper, or one of the copper alloys, such as gunmetal or delta metal. Where the ironwork is in itself valuable, as are the mediæval saddle and stanchion bars of windows or the wrought-iron rails of the eighteenth century, it should be carefully taken out of the stonework and new rustless metal ends should be welded on to the bars which are bedded in the stone, and the whole reset in cement mortar. The welding of the copper alloys to iron can be done by acetylene or electric means. At the joint between the two metals electrolysis is encouraged, and the iron there rusts away more quickly than elsewhere, but this damage is confined to the metal work, and does not affect the stonework. Of recent years sulphur has been used to set iron into stone. It is hardly necessary to note that this practice is pernicious. Wherever I have found it used I have also found failure.

The removal of iron cramps from stonework is not always a simple matter. Although the intention should be to take every piece out and to substitute a rustless metal, there are cases where as yet no rust has begun, and where, as a consequence, the stone is as yet uninjured. In these cases it may be well to leave the ironwork undisturbed, for in its removal damage may easily be done to the stonework. In this regard it should be remembered that mediæval and eighteenth century iron has much less tendency to rust than the modern. Where it has been determined to leave the iron in the stone, efforts should be made to check the penetration of rain. Often this may be done by the use of good oil paint applied periodically to the junction of the stone and iron.

Damp-proof Courses in Old Buildings.

In every new building damp-proof courses are laid through the thickness of walls immediately above ground and in all walls, be they chimneys or parapets, immediately above the roofs. In two cases, however, I have found traces of courses of slate having the appearance of a damp-proof course laid in the walls of a mediæval building. These traces were seen about five feet above ground in the fifteenth century work of Christchurch Priory and in the unfinished early sixteenth century cloisters of Cleeve Abbey, where one or two sections of the walling are now exposed for the full thickness from the wall face. It is doubtful whether these courses of slate were indeed laid to prevent the rise or fall of moisture in the wall.

It is certainly desirable when repair work is being done to those parts of an ancient building where damp-proof courses are useful that they should be put in. But this is not all; sometimes they should be inserted in old walls for their own sake alone, not only to keep the inside dry, but to prevent the surface decay which an excess of moisture encourages. The exposed faces of wall tops are particularly liable to suffer in this way, as may sometimes be seen in the top four or five feet of parapeted structures. It is difficult to decide whether or no damp-proof courses should be inserted in such cases, for one evil may be remedied at the cost of creating another. More of the interest and beauty of the affected surface of an ancient wall may be sacrificed, whether near the ground or at the level of a parapet, by disturbing it than is worth while for the sake of freeing it from a little damp. In parapets it is usually enough that the bed of the coping stones is impervious, and that the two faces of the wall are properly pointed.

Damp working its way into a wallface, from below the ground, often due to concentrated saturation by roof water, has already been dealt with on general lines in the article on disposal of rain water, to which reference should be made. Here the insertion of horizontal damp-proof courses will be discussed.

Probably the form of damp-proof course most suitable for the mortar-built walls of monumental architecture is the one laid in the material of the same general nature, that is, the double course of slate laid in cement mortar. Mr. Thackeray Turner recommends sheet lead, because it can be unrolled easily, is continuous, and if laid on an even bed is not cracked or broken during the process of pinning up to the work over. The same principles apply to the form of damp-proof courses in old walls as apply to those in new; the decision whether or no such a course should be put in rests on cost and on the harm the alteration may do, or the changes it may make to the qualities which give value to the building.

There is no more difficulty in cutting out for a damp-course and building it in than there is in cutting out loose work and repairing the wall *by building*. In both cases only small pieces of work can be done at a time, and in both cases the walling adjoining the part treated should not be touched until the new work has set. The bed on which the damp-course is laid should be smooth and level or stepped in a series of levels. When a wall is cut out for a damp-course it may be well to take the opportunity to build a strengthening belt for the length of the wall.

A machine has been invented for laying damp courses in lime-built brick walls, or walls which are soft enough to be cut with the saw that forms part of the machine. But this does not appear to have been much used, though a claim is made for it that it causes little disturbance to walls.

For vertical damp courses underground, asphalt laid in two thicknesses on properly prepared walls seems to be the best. Owing to the fact that the laying of asphalt requires expert men and special plant, which are not easily to be had in country places without undue expense, it is not uncommon to rely on water-proofed cement rendering or vertical slate in cement damp courses for this work. These when they fail, do so more because proper preparation is not made for them than because of any intrinsic fault. The reason for this seems to be that a builder will take more trouble to prepare for an expensive and unfamiliar material than he will for one which he constantly handles.

Although damp cannot be certainly prevented from rising in a wall from the soil unless a horizontal damp-proof course is put in, much can be done both within and without by taking all other precautions. Thus a joist floor laid within a building may be rendered immune from such defects by being laid with a ventilated air space beneath, above an impervious bed of concrete and separated from the walls themselves by a vertical damp-proof course. In such a case joinery, as panelling, bench ends, or skirtings may also be separated from the walls either by a damp-proof course or a sufficient air space. In timber-framed buildings the damp-proof course can conveniently be laid beneath the timber sill on which the uprights are set.

Short Course in "Appreciation of the Crafts."

In order that teachers in Wales may see and study for themselves what is being done to-day by capable students and craftsmen, the Welsh Department of the Board of Education has made arrangements for a short introductory course in "The Appreciation of the Crafts" to be held in London at the Royal College of Art, South Kensington, London, S.W.7, from August 6 to August 18, 1928. Teachers selected to attend the course will be afforded the advantage of studying the collections at the Victoria and Albert and other London Museums of all that is best in the work of the craftsmen of every period and nationality.

ILLUSTRATIONS

The New Lloyds.

We give as our frontispiece this week a view of the great entrance to the new Lloyds in Leadenhall-street, and on our "Notes" pages some details of the decorative carving above the string-course level. Other illustrations of the work were given in our issues for March 30 and April 6, in the former of which appeared a special article giving the names of the artists and firms associated with the work. Plans of two floors are given on page 614.

Sir Edwin Cooper is the architect.

Westminster Bank, Piccadilly.

We illustrate this week the new building for the Westminster Bank, which has been erected in Piccadilly from the designs of Mr. W. Curtis Green, A.R.A. The banking accommodation may be studied from the accompanying plan. The building is in Portland stone, and the elevations are relieved by some well-designed ironwork in the form of balconies, etc. The general contractors were Messrs. Leslie and Co., Ltd., and among the artists, craftsmen and subcontractors engaged on the work were the following: H. Sabey and Co., Ltd. (demolition); Moreland Hayne and Co. (structural steel); Diespeker and Co., Ltd. (patent Bigspan roof and flooring); the Luxfer Co. (Luxfer electro-copper glazing); the Acme Flooring and Paving Co. (wood-block flooring); Docker Bros., Ltd. (Induroleum fireproof flooring); R. H. and J. Pearson, Ltd. (heating and hot water); T. Elsley, Ltd. (grates); City Electrical Co. (electric wiring); Trollope and Sons (electroliers); John Bolding and Sons, Ltd. (sanitary fittings); Stedall and Co., Ltd. (door furniture); Haywards, Ltd. (reinforced-concrete pavement lights, bronze windows, steel casements and iron staircases); Samuel Elliott and Sons, Ltd (revolving doors); Caston and Co., Ltd. (folding gates, wrought-iron balcony railing, balustrade, bronze grilles); Leslie and Co., Ltd. (stonework and joinery); Laurence Turner (stone carving); J. Whitehead and Sons, Ltd. (marble paving); Art Pavements and Decorations, Ltd. (wall tiling); Cowtan and Sons, Ltd. (bank counters, desks, etc.); Smith, Major and Stevens (lifts); John Clark, Ltd. (name plates).

The Frascati Restaurant.

The work recently carried out at the Frascati Restaurant is an attempt on the part of the architect to introduce some modern materials and workmanship to express in a modest way the modern movement in design, inspired by some of the recent work that is to be seen on the Continent. Many difficulties due to the existing structure and the special nature of the business have given opportunities for departing from what might be termed strictly traditional motives. An effort was made to have all the work prepared by firms in this country to the architect's own details, and the several sub-contractors employed in the work have done their very best to give real artistic expression to their work.

Although the directors of the restaurant were inclined at first to replace the whole of the building in Oxford-street, the architect decided to retain substantially the character of the old building, adding features to it to produce the desired effect. The external metal work, which is rich in detail, is in gilt, to preserve as far as possible the character of the special treatment. Several alternatives were tried for obtaining a satisfactory and lasting finish, but double leaf gold was found most satisfactory. It was desired that the effect should be cheerful and spacious, and the large mirrors that have been introduced give this effect.

The directors gave the architect a free hand to design not only the decorations, but all furniture and carpets, so that the result should be in harmony throughout. It was somewhat difficult to blend the new work with the existing, but this has been successfully done where the new work is in juxtaposition with the old, by painted decorative panels by Mrs. Eleanor Abbey. The plaster relief panels have been appropriately designed and executed by Mr. Percy Bentham.

The general contractors were Messrs. Godson and Sons, Ltd., and the following were sub-contractors:—The Birmingham Guild, Ltd., Messrs. J. M. Piris and Co., Ltd., and the Kingsmill Art Metal Co., Ltd., wrought-iron metal work; Messrs. Jade, furniture and electroliers; Messrs. Morris-Singer Co,. decorative glass; the Kingsmill Art Metal Co., metal lamp standards, table and flower boxes; Messrs. Burke and Co., and Messrs. Anselm Odling and Co., Ltd., marble work; Messrs. Martyn and Co., Ltd., plaster work.

Mr. Stanley H. Hamp, F.R.I.B.A. (of Messrs. Collcutt and Hamp) was the architect.

A House at Harrow.

We reproduce from the current "Domestic Architecture" number of *Architecture*—now on sale—a charming little house in Hillside Avenue, Harrow-on-the-Hill, from the designs of Mr. A. P. Starkey.

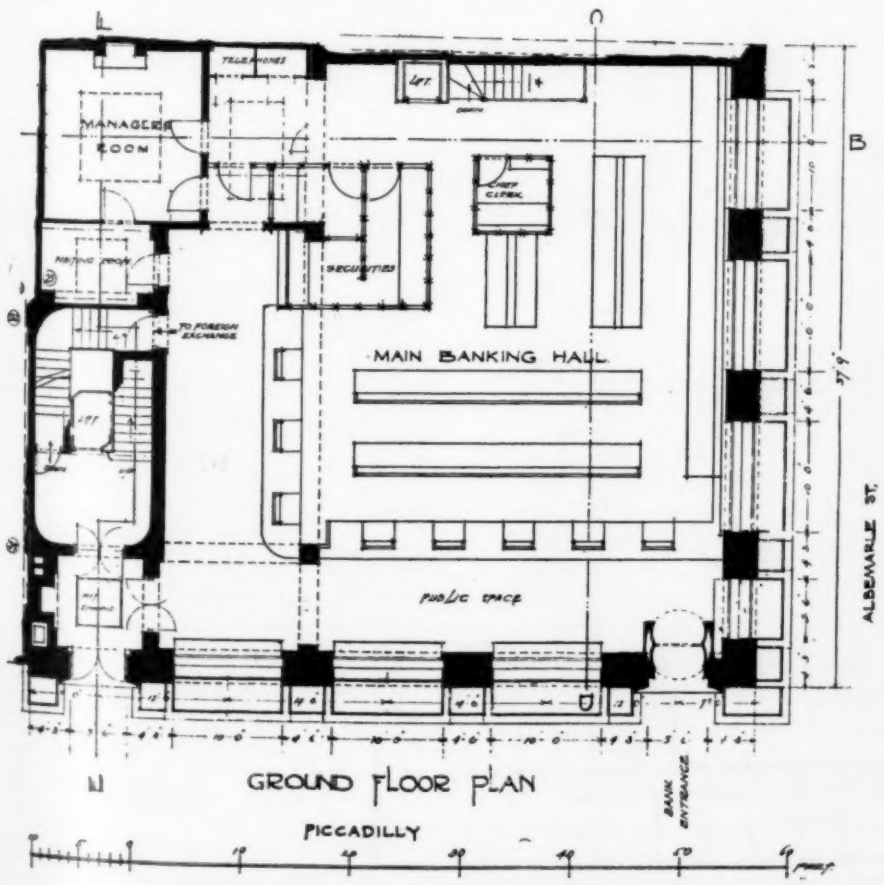
New Science Museum, South Kensington.

The site of the new building for the Science Museum is situated between the Natural History Museum on the south and the Imperial College of Science on the north. The complete scheme will extend ultimately from Exhibition-road on the east (frontage 250 feet) to Queen's-gate on the west (frontage 160 feet), the total length of the building being 1.130 feet. It displaces, as it is built, the old existing Southern Galleries of the 1862 exhibition, now used to accommodate the Science Museum. The long north and south elevations will be faced in red brick with stone dressings, such treatment being confined to the frontage screened from public view by existing buildings and future extensions. The shorter east and west elevations, with returns, will be stone-fronted.

The columns and column foundations, floors, roofs, including Mansard slopes, and all constructional units of the building are in reinforced concrete, carried out in the Coignet system. The sizes of columns exposed to view in the galleries and all beams over such columns were fixed to give reasonable architectural proportions, and the spacing of all floor beams was arranged to give a uniform panel treatment in the ceilings. The heating and service ducts, which are carried round all galleries, considerably complicated detail constructional design. The segmental ribs to the large arched roofs to the large lighting hall and top-lit gallery at ground-floor level are constructed in reinforced concrete, together with the vent trunks over them. Provision is made in these trunks for fixing an electric fan should natural ventilation prove insufficient. The staircases are formed in reinforced concrete and finished with 2-in. York stone treads and risers.

The main east front to Exhibition-road is in Portland stone. The architectural treatment is in Renaissance style of a dignified character, with a series of 12 Ionic columns 35 ft. in height running through the first and second stories, flanked at the ends with wide piers. The ground-floor story is in rusticated ashlar work. The Mansard slopes to the roofs are faced with green Tilbertwaite slates crowned with a moulded lead cresting. The gallery windows, averaging in size about 11 ft. by 8 ft., are in steel, and the sashes are all hung to permit of cleaning from within. All flat roofs are covered with asphalt. Internally, the walls and ceilings are finished with a simple plaster treatment. The floors are finished with oak boarding on fir battens. A feature of the floor construction to the galleries is the elaborate system of ducts. These comprise one smaller duct 10 in. wide for heating pipes, and a wider duct 2 ft. 3 in. wide, which accommodates the lighting, gas and compressed-air mains. The compressed air, which is used for operating the models, is supplied by plant situated in the basement and circulated by pipes throughout the floor duct system. The heating is by hot-water radiators.

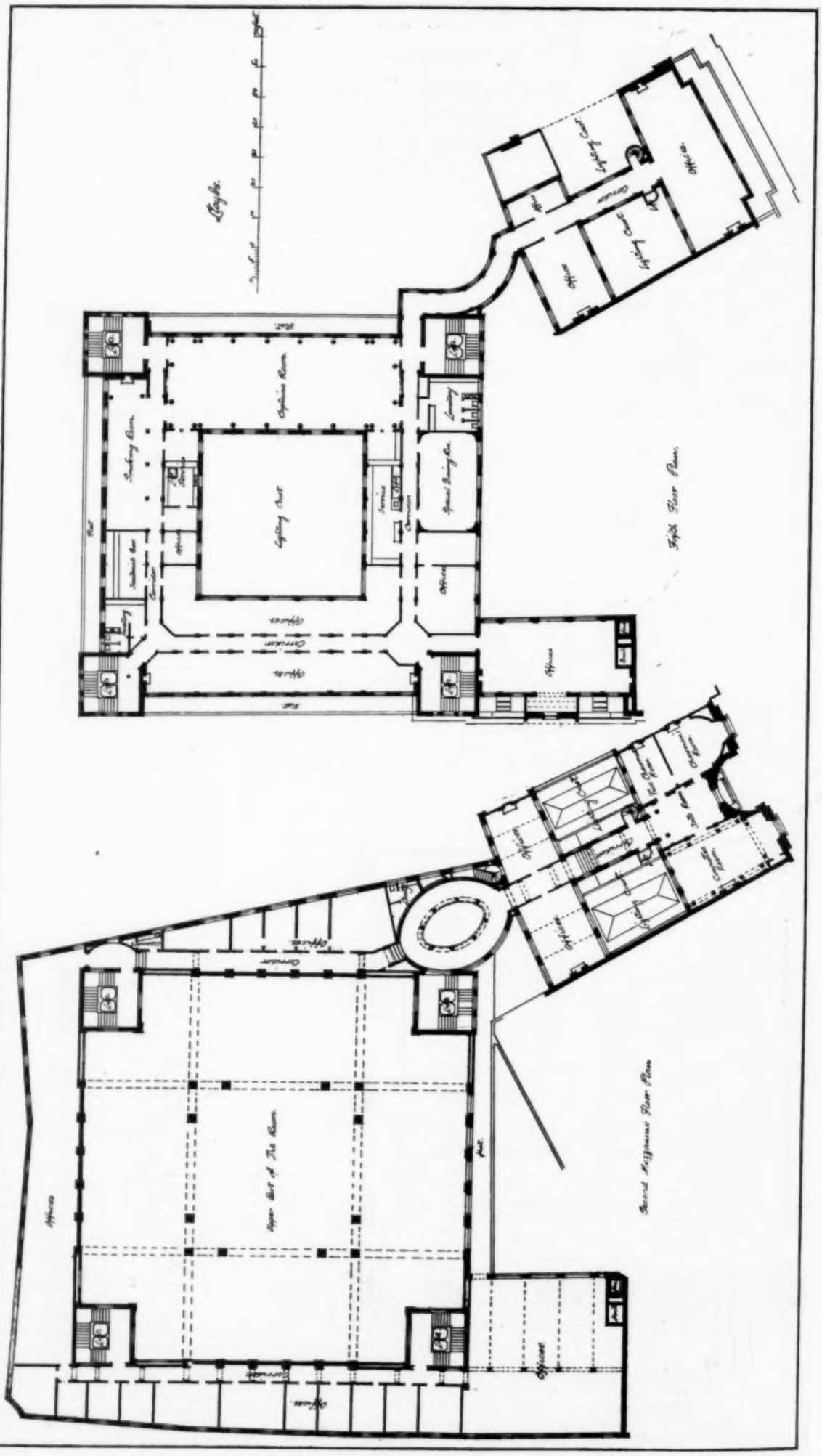
Sir Richard Allison, C.B.E., F.R.I.B.A., Chief Architect, H.M. Office of Works, was the architect.



GROUND FLOOR PLAN

Westminster Bank, Piccadilly, W.

Mr. W. Curtis Green, A.R.A., F.R.I.B.A., Architect.



Lloyds, Leadenhall Street, E.C.

Sir Edwin Cooper, Architect.

The Westm'nster Bank, Piccadilly, W.

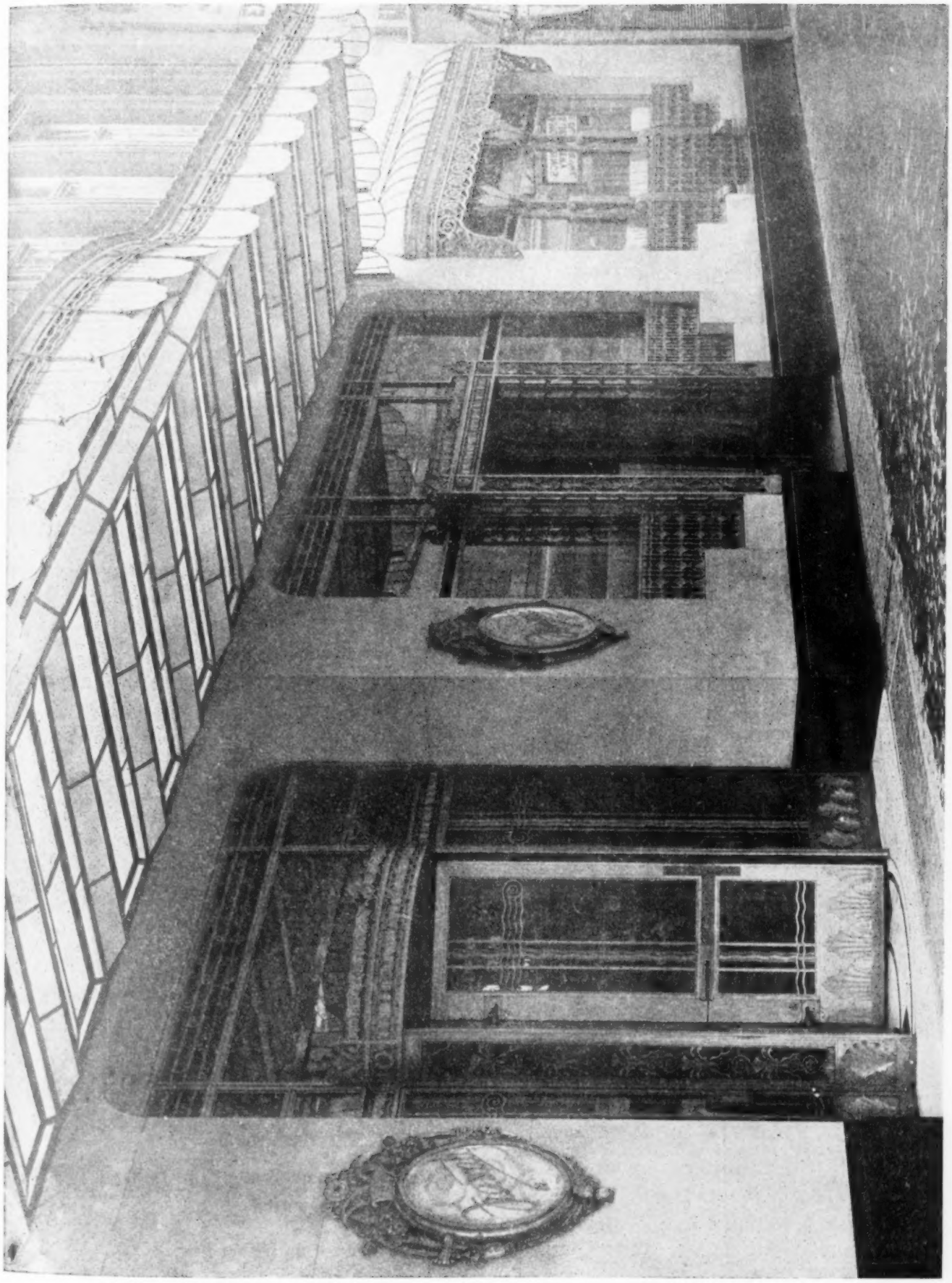
Mr. W. Curtis Green, A.R.A., F.R.I.B.A., Architect.

UNIV. OF MICH.

Frascati Restaurant, Oxford Street, W.: Decorations and Remodelling.

Mr. Stanley H. Hamp, F.R.I.B.A. (Messrs. Collcutt and Hamp), Architect.

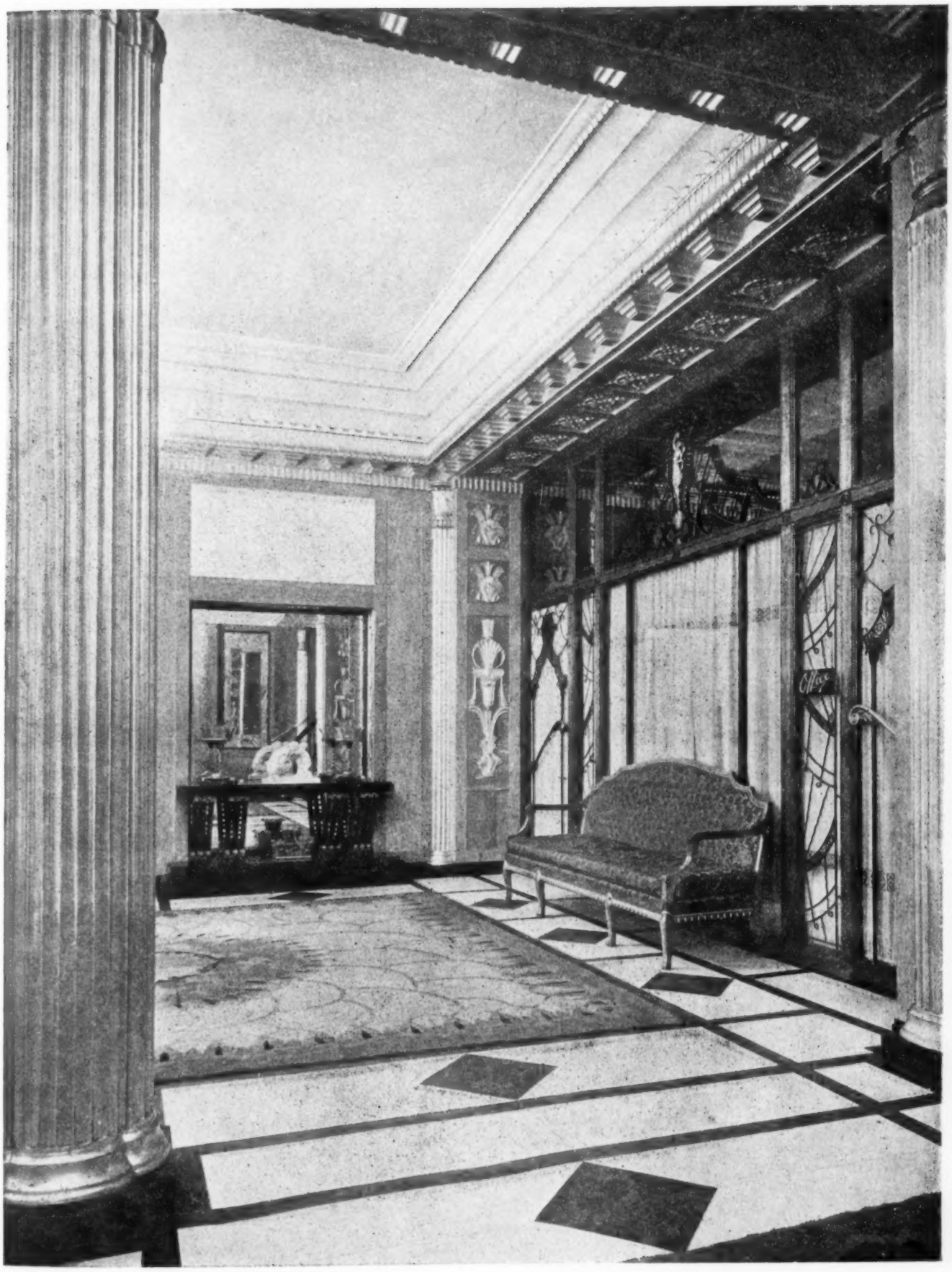
UNIV. OF MICH.



Frascati Restaurant, Oxford Street, W.: Detail of Main Entrance.

MR. STANLEY H. HAMP, F.R.I.B.A. (Messrs. Collcutt and Hamp), Architect.

UNIV. OF MICH.



Frascati Restaurant, Oxford Street, W.: Detail of Office Screen.

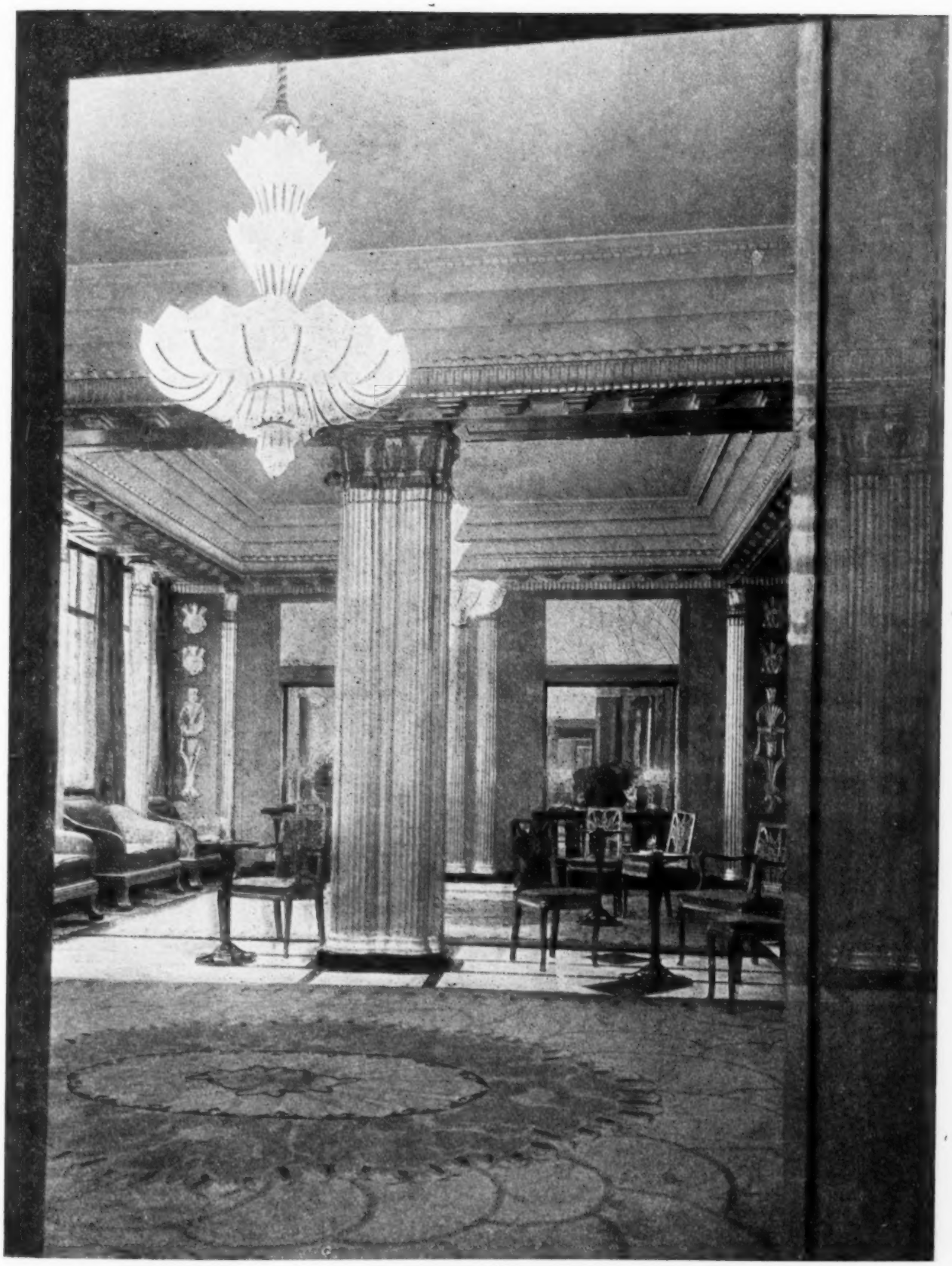
MR. STANLEY H. HAMP, F.R.I.B.A. (Messrs. Collcutt and Hamp), Architect.

UNIV. OF MICH.

Frascati Restaurant, Oxford Street, W. : View in Foyer.

MR. STANLEY H. HAMP, F.R.I.B.A. (Messrs. Collcutt and Hamp), Architect.

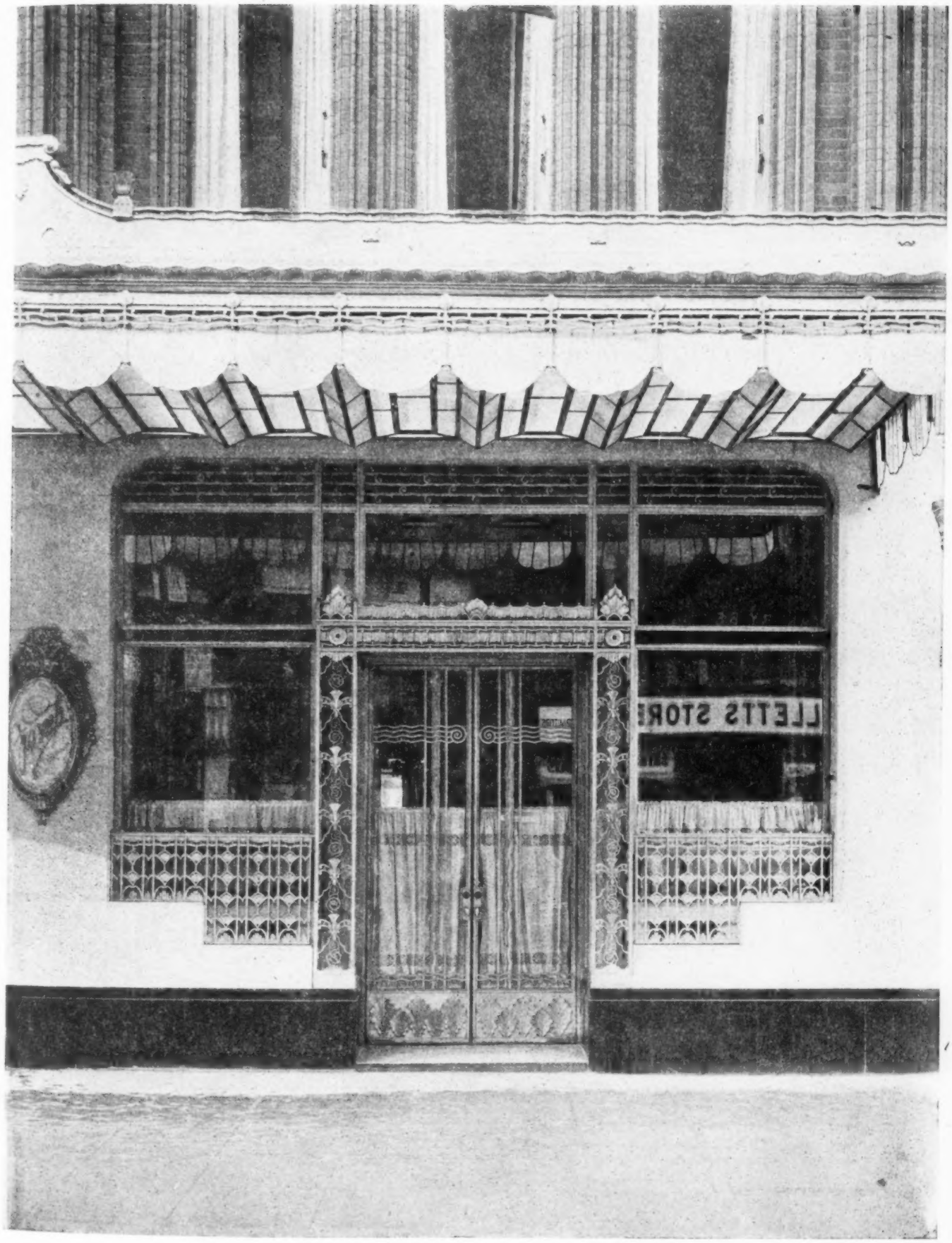
UNIV. OF MICH.



Frascati Restaurant, Oxford Street, W. : View in Foyer.

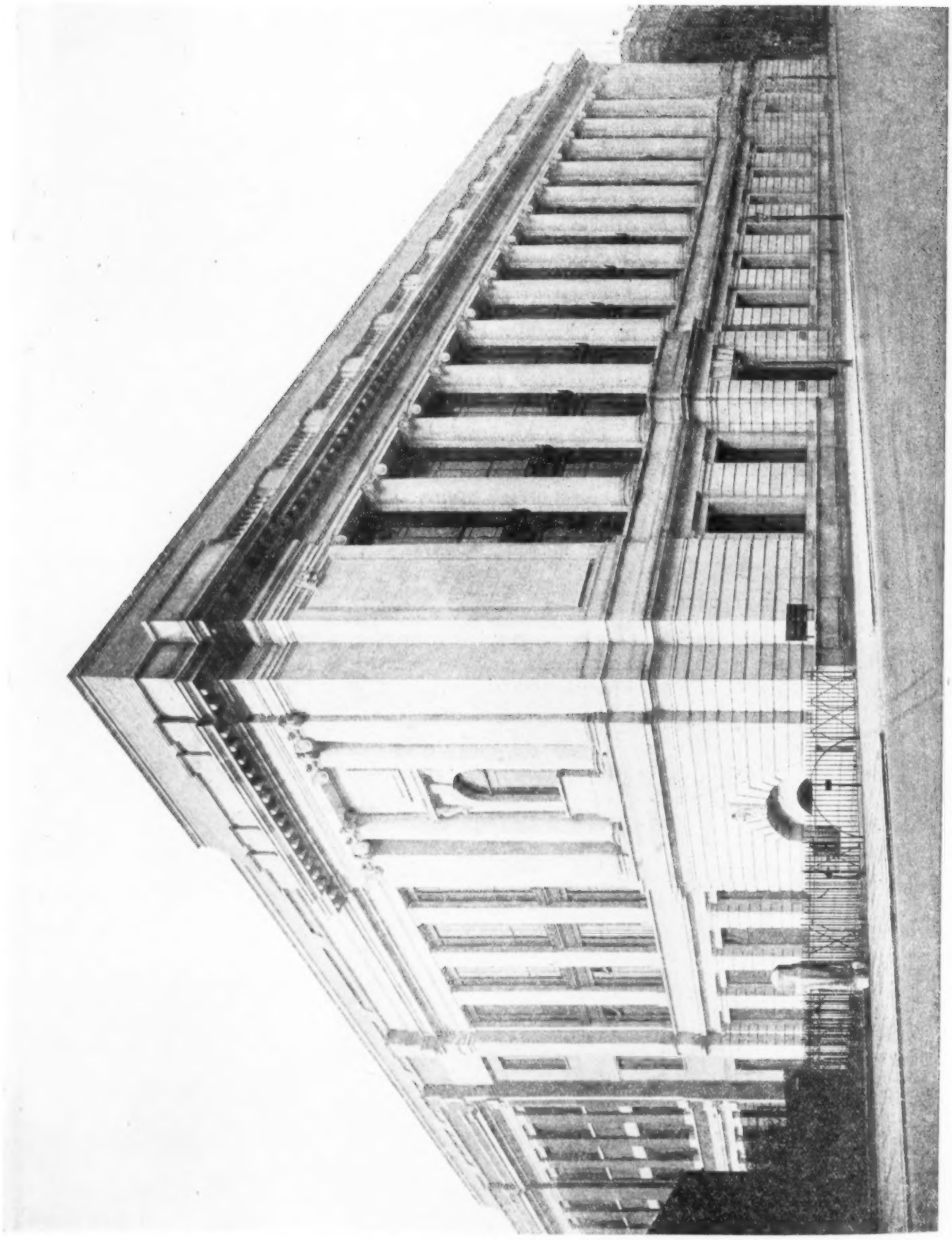
MR. STANLEY H. HAMP, F.R.I.B.A. (Messrs. Collcutt and Hamp), **Architect.**

UNIV. OF MICH.



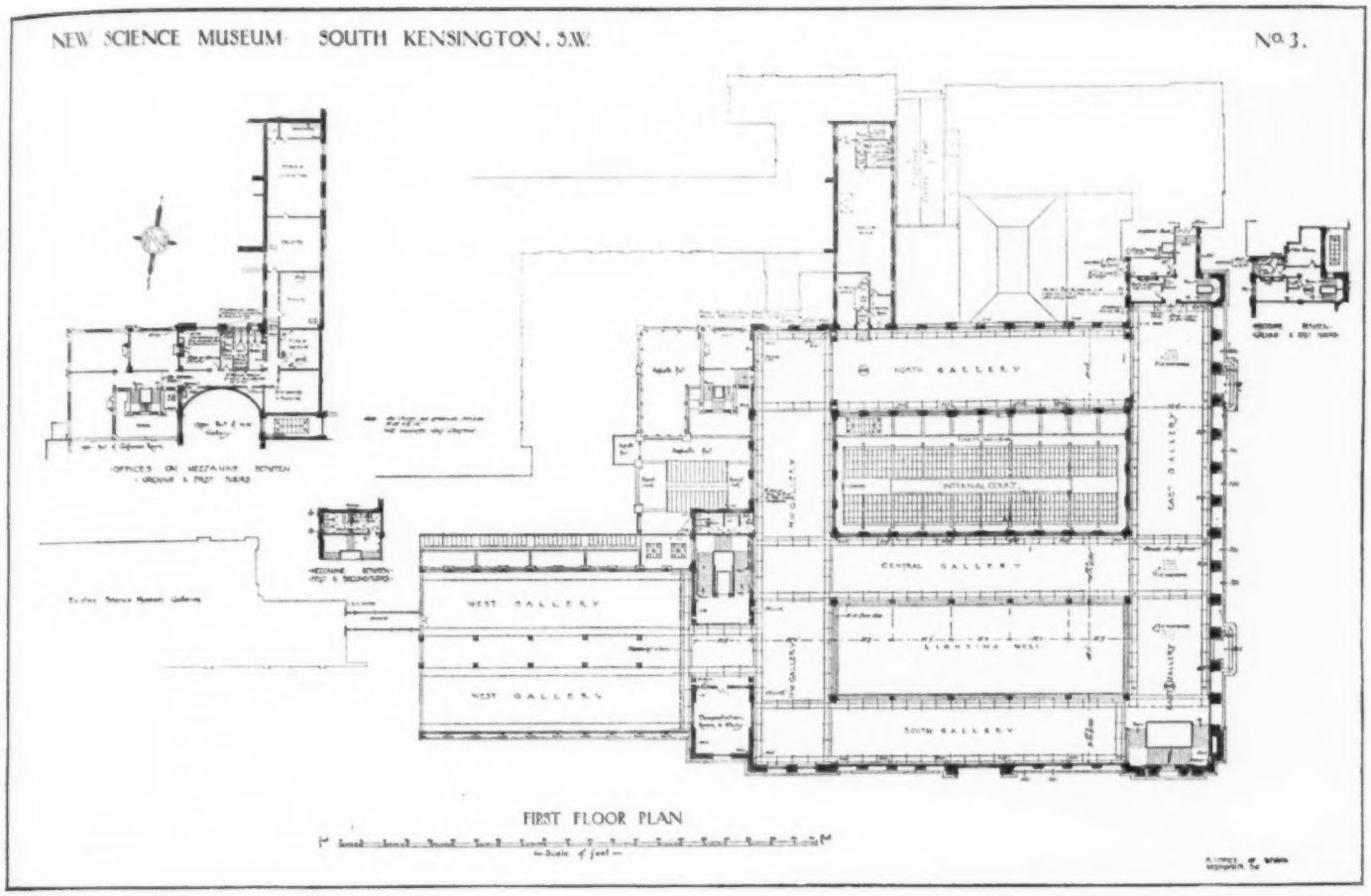
Frascati Restaurant, Oxford Street, W.: Grill Room Entrance.

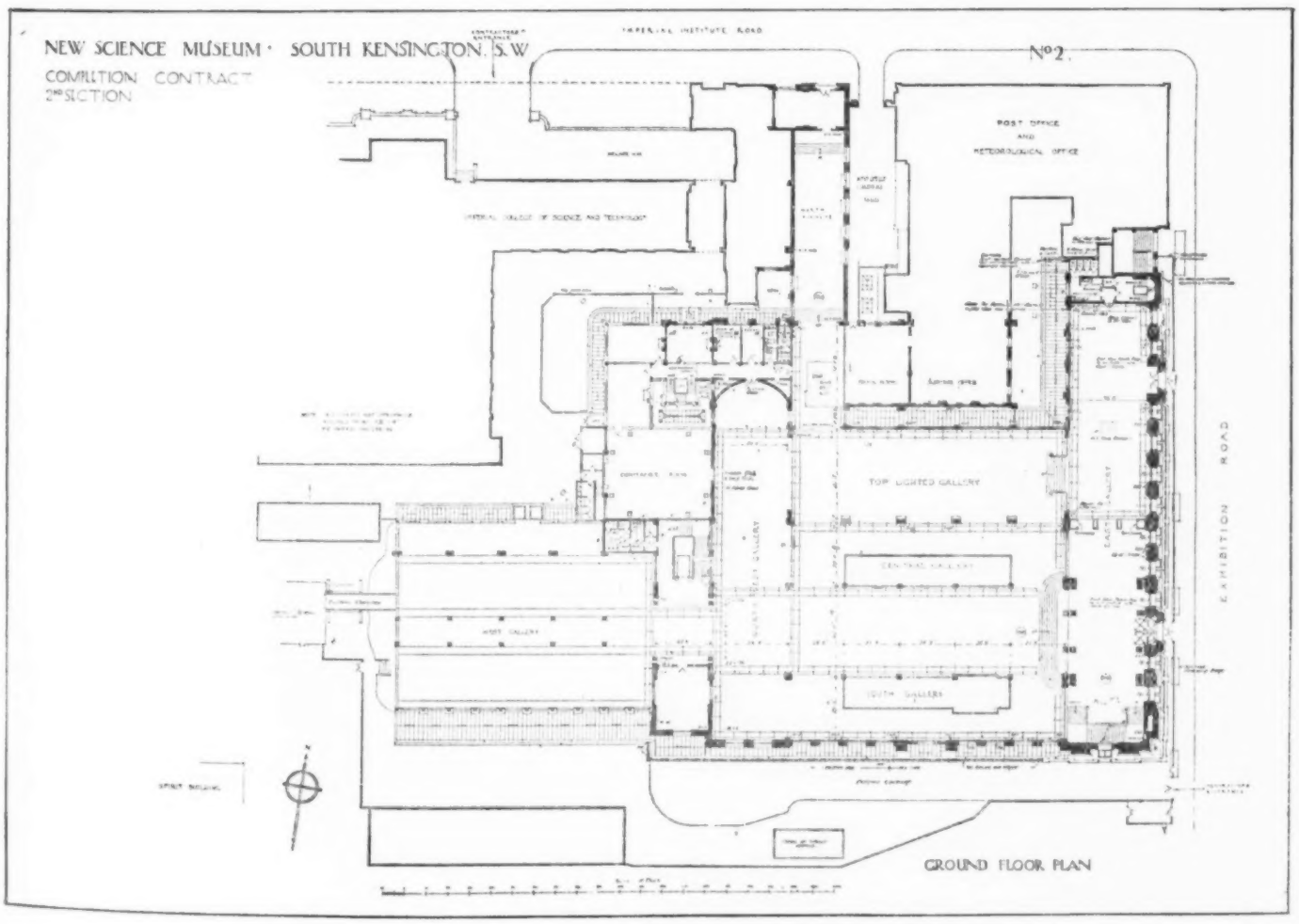
Mr. Stanley H. Hamp, F.R.I.B.A. (Messrs. Collcutt and Hamp), Architect.



The New Science Museum, South Kensington.

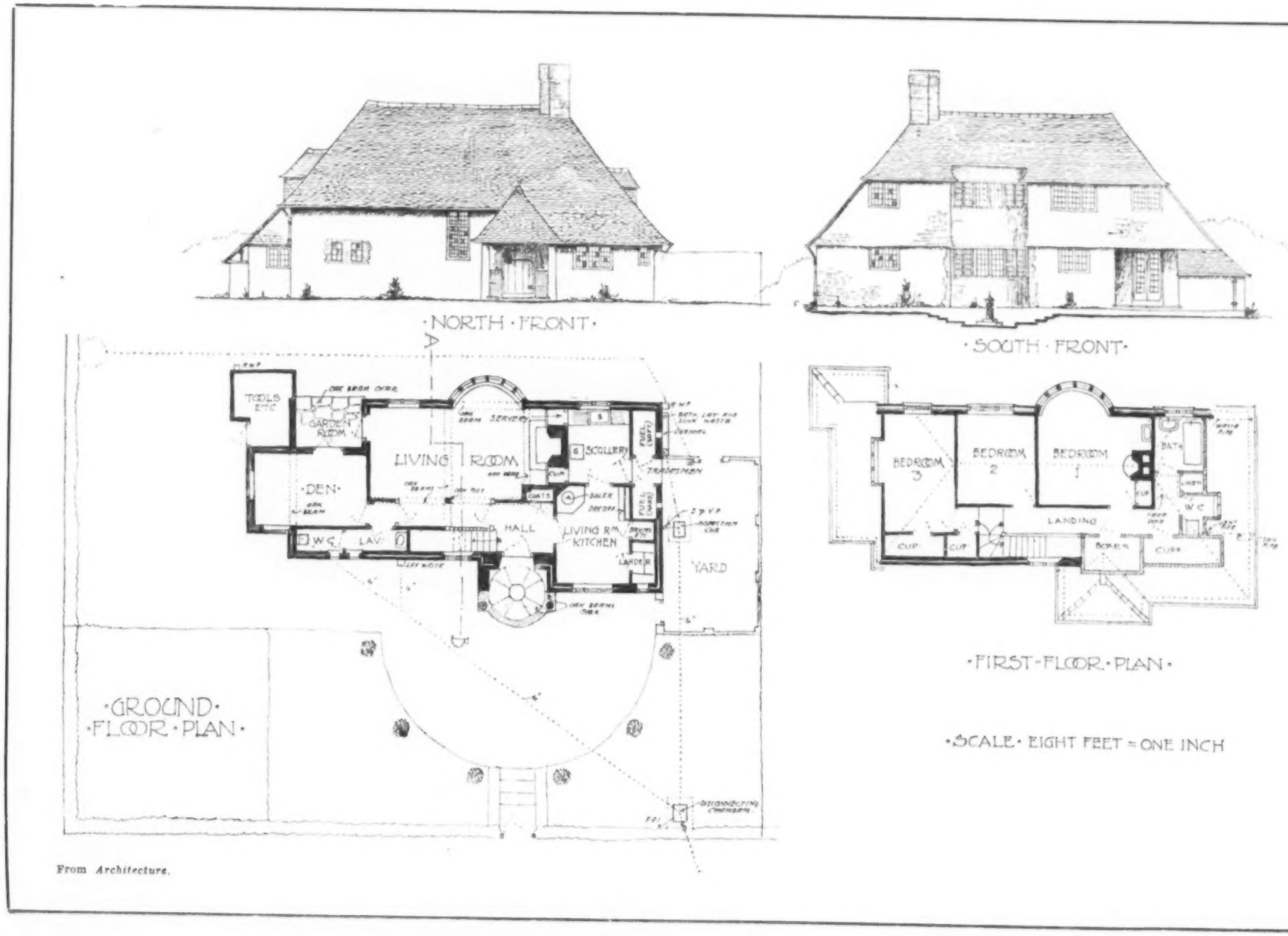
Sir Richard Allison, C.B.E., F.R.I.B.A., Chief Architect, H.M. Office of Works.





The New Science Museum, South Kensington.

SIR RICHARD ALLISON, C.B.E., F.R.I.B.A., Chief Architect, H.M. Office of Works.



From *Architecture*.

House at South Hill Avenue, Harrow-on-the-Hill.

Mr. A. P. Starkey, Architect.

MODERN FLATS IN LONDON

By F. E. BENNETT, A.R.I.B.A.

II.—MODERN PLANS

FLAT buildings in London vary considerably in their plan shapes. Unlike some foreign cities which are laid out on regular lines, London has grown up with no laws to fix or maintain the regular shapes of building sites, so that portions of land to-day taken over for building development are rarely similar, and, if they do happen to be, it is merely a coincidence. This fact and also the peculiar restrictions of ancient lights affecting each particular site has led to the variety of general shapes which are to be seen in the plans of flat buildings; so that in endeavouring to make a comparative analysis of selected plans, it is found to be a little difficult to arrive at some basis for study. Towards simplifying the difficulty, however, three plans which are already fairly well known are given after having been reduced to a diagrammatic form.

FIG. 1 is the typical plan of 40, Park-lane—4 flats, 30 rooms, corner site about 190 ft. by 65 ft., 7 stories. Architect, Mr. Frank T. Verity; contractors, Messrs. W. H. Lorden and Son.

This was built seven years ago, and is a good example of the best kind of work up to that period. It is excellently situated on a busy thoroughfare, with splendid views over Hyde Park from the windows of its front elevation. The site was undoubtedly a very good one for its purpose, as the whole area of it is built upon to the full 100 ft. height, with three small areas to penetrate the internal dark portions. The opportunity to use the party wall for a complete range of windows has made possible a very large accommodation on the plan, but at the same time this advantage may possibly be jeopardised if property owners at the rear decide to build higher.

To each group of two flats there is one lift and two staircases, the lift running down the well of the main stair in accordance with an accepted practice. The three portions of each flat, namely, service, sleeping and living are well segregated, the service being separated from the dining-room by a longish passage or via the hall. An interesting feature of the plan is the fact that there are only two w.c.s and one bathroom to each flat, and it will be noticed that sculleries adjoin the kitchens.

The dignified appearance of the façade is due partly to the largeness and squareness of the window openings and partly to the full-blooded stonework treatment adopted. A very regular spacing of the windows seems to have reacted on the plan to some extent and caused a dullness by the repetition of similar shaped rooms. The entrance is placed in the centre of the façade and the doors and the vestibule are unassuming. Ideas have changed a good deal since this building was planned.

FIG. 2.—Typical floor, Devonshire House, Piccadilly—9 flats, island site, 64 rooms, 8 stories. Architects, Mr. T. Hastings and Prof. C. H. Reilly; contractors, Messrs. Holland and Hannen and Cubitts, Ltd: Built 1925.

Much of the site is given up to provide a large court, two outer courts and a set-back on part of the Piccadilly frontage. The building is then resolved into a series of wings of an approximate unit width to comprise two rooms and the corridors and bathrooms between. The nine flats are served by four passenger lifts and four service lifts. The seven stairways, all of which are small and subordinate and designed for emergency only, are arranged so that two of them are available to each flat. The remarkable feature is the bathrooms, some of which have no natural lighting, but are ventilated artificially. In addition to this, there is the new feature of lifts, both passenger and service, quite separated from staircases and without light. The lifts are intended for the main traffic, and, accordingly, open into relatively large vestibules on each floor, which also have no daylight. Although some straggliness is apparent in the general plan, the amount of corridor space is reasonably small. In the service portion of the flats the plan becomes very "developed." There are no sculleries, there is sometimes no pantry; the service suite of kitchen, two small servants' bedrooms, combination bathroom and the necessary cupboards is very compact, with direct connection on the one side with the front door and on the other side with the dining-room. Large public compartments are provided on the ground floor, which occupies the whole site, and the entrance to the flats is in the rear. The elevations of ashlar and stonecarving, together with the general massing, succeed in giving the building a palatial appearance.

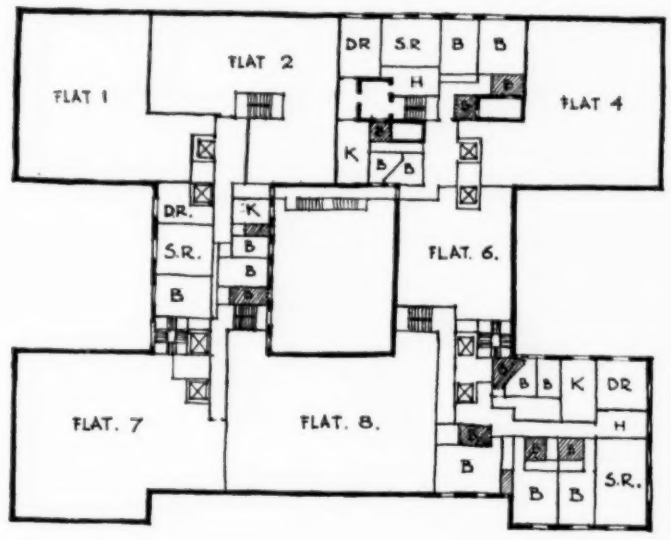


FIG. 2.

FIG. 3.—Typical floor, 49-50, Grosvenor-square, 2 flats of 10 rooms each, site with three open sides, 6 stories. Architects: Messrs. Wimperis, Simpson and Guthrie.

This is an example of the smaller type of building. The diagram illustrates a plan very much cut up owing to the difficulties of lighting, the property at the rear forcing a large incursion for areas. In addition a central area has been introduced. Although the building in this case is comparatively small, the flats are large—considerably larger than in the two previous buildings. The plan is a good one, and shares some of the characteristics of the last example. Instead of the one bathroom for the flat as in Fig. 1 there are now three bathrooms for four master bedrooms and one for the servants. The halls are very large and well lit at one end. The master bathrooms are accessible from vestibules leading off the hall, and three of them are placed on the outside wall, with pipes apparently carried down on the inside of the wall. The rooms provide an interesting contrast of shapes, but perhaps a weakness is that the dining-room of the left-hand flat is rather dissociated from the sitting-room.

The elevations of this building are designed in what is, perhaps, the true style for flats, namely, the traditional Georgian (see perspective view, *Builder*, January 21, 1927) of red brick, stone quoins, cornice and occasional dressings, with sash windows and red tiled roof. The roof takes the mansard form in order to accommodate the attic story.

FIG. 4 is a rough site plan of the new flats being erected where Grosvenor House stood. The two buildings together will form one of the largest flat buildings in the world, and will contain apartments of varying sizes on

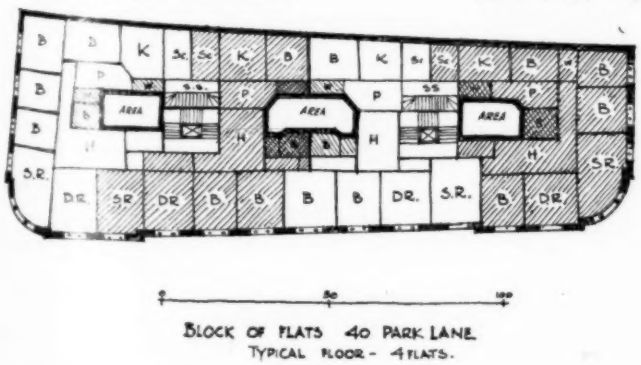


FIG. 1.

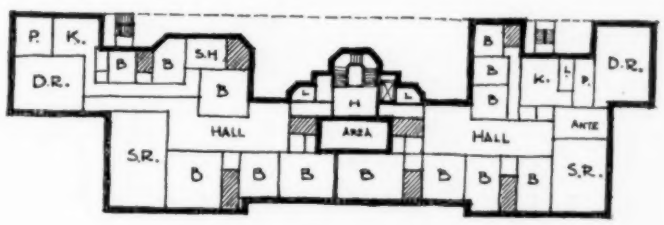


FIG. 3.

seven floors, with shops and public compartments on the ground floor. The block plan appears to have been arrived at by applying the principle of the unit wing of 50 ft. (about) width. With this site it has led to the formation of two hollow squares with the addition of saw-edge projections on the main front and the provision of a new roadway in between the two blocks running east and west. The inner courts are so large that living rooms facing into them will not be objectionable, as they usually are with smaller inner courts.

Much private discussion is already taking place over the design and massing of these buildings. Although only the one building is erected, and at that only partially finished, the design shows itself to be one on quite new lines for London. The interest of the observer is concentrated on the ground floor shops and mezzanine by reason of their rich treatment in stonework of the Corinthian order, while above on the first floor the stonework is continued to form an additional band of rich decoration. Above this, as if from a socket, the building rises solidly and plainly in red-brown bricks, pierced by a great number of unadorned window openings. There is no main cornice, but over the corners of the building towers of delicately-cut stonework stand high and can be seen in Hyde Park from a long distance.

EXHIBITION NOTES

THE WALKER GALLERIES.

One of the most attractive collections of water-colour drawings we have seen is that by Mr. Ernest A. Chadwick at the Walker Galleries, which is closing this week. There is a considerable variety of subject and treatment, but in the expression of sunny effects the artist is very conspicuously successful, as in "The Golden Sail, Concarneau" and "The Fishing Boat, Concarneau," and the "Parade, Concarneau." The artist is, however, adept at the realisation of tone and colour, as his larger drawing of "The Cave" strikingly shows. He gives a rendering of "St. John's Bridge, Tewkesbury" (*The Builder*, March 23), which is almost more successful in black-and-white than in colour. The value of old architecture finds a very good illustration in "Market Day, Chipping Campden," and the "Post Office, Henley-in-Arden." We shall hope to see more of Mr. Chadwick's work. An exhibition which will interest architects specially is the collection of water colours in the Cox room by Mr. Edward Wimperis, the architect who is son of the well-known landscape painter, the late E. M. Wimperis, and who has inherited something of his father's talents, though as architect to the Grosvenor estate and other activities he cannot find much time to indulge in picture making. His drawings are in most cases more in the nature of studies, often very vigorous and expressive, but chiefly concerned with the broad aspects of scenery, and suggest rather the pleasure of the artist in his work than of any aim to make pretty pictures. The making of drawings like this must be much value to one who can lighten the practical and prosaic labours of building by studying in this pleasant way the forms and colours which appeal to one in country scenes. That Mr. Wimperis knows something of colour values may be noted in "Bolton Bridge" (68), "Below Cader Idris" (10), and "The Moors above Kinloch Rannoch" (49).

Architectural Etchings.

Etchings by F. L. Griggs at the Colnaghi Galleries will interest architects, for architecture is seldom treated with an equal degree of force and delicacy and a full appreciation of form and details. There is a certain hardness about the handling of these etchings which seems to be a continuously increasing effect in his work, but there is much richness and depth in his landscape work, such as Nos. 21, 30, and 35.

Pastel Drawings, etc.

The exhibition of pastel drawings, lithographs, and sketchings by Jas. A. Grant at Paterson's Gallery, in Bond Street, is one of those pleasant reminders that we still have artists who believe it is worth while to show us beautiful subjects of form and colour, and make no effort to call for notice by eccentricity or odd subjects. This artist gives a very real vitality to all his figure subjects, and, though the keenly critical might see a lack of solidity and character in some of his pictures, we cannot fail to be conscious of a pleasurable result, both in the form and colours he gives us. We cannot, perhaps, form a fair opinion of his capacity as an etcher from the few specimens shown, but there is a hardness and spottiness in his little bridge scene which we hope he will get over.

On the whole, the 190th exhibition of the Royal Society of Painters in Water Colours, in Pall Mall, which we may remember as founded in 1804, is not one of the best. The president, Sir Hughes Stanton, has same telling subjects, but we feel some disappointment with what is shown by Oliver Hall, Lamorna Birch, Sir C. J. Holmes, and others who have always appealed to us for some special and interesting artistry. A solidly painted picture called "Safe in Harbour," by Robt. W. Allan, gives a breadth of tone and glowing colour and fine realisation of the safe harbourage of boats within sight of a swirling, treacherous sea outside. The dainty atmospheric effects of Moffat Lindner's drawings, the admirable force and realism of A. S. Hartrick's "Fisherman," "A Church, Pakefield," the charming bit of colour in W. Lee-Hankey's "Weed Burning," the poetic feeling in "The Morning" by Henry A. Payne, the fine effect of "Waning Summer" by Wm. T. Wood, and a good architectural drawing by Chas. M. Gere are items which attracted us; but as we go over the catalogue we note many well-known names which somehow should have made the exhibition a better one.

INDIAN ARCHITECTURE*

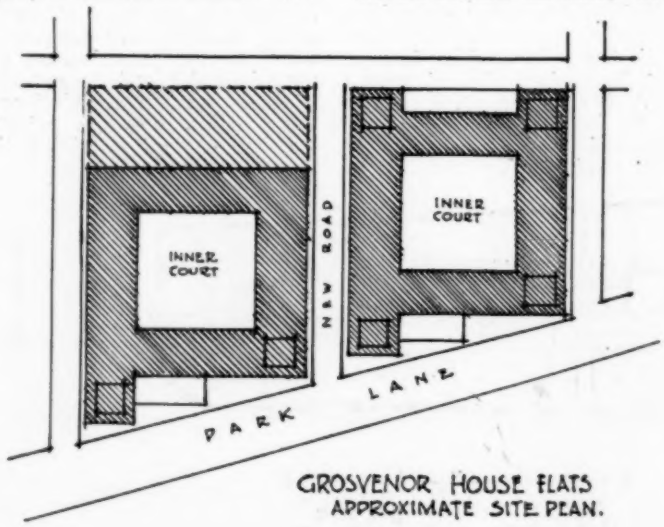
In 1924 we reviewed the author's book, "The Himalayas in Indian Art," and in the concluding chapter the author then had something to say concerning the outlook of architecture in India under British rule. For 40 years he has tried to teach "that the livingness of Indian art (not the Indian-ness) is the only thing that matters," and in this, the second, edition of his great and comprehensive work, "Indian Architecture," he very ably deals with this controversial subject. He works up to this really vital question of modern outlook in 250 pages of text, profusely illustrated, presenting us with a comprehensive history of Indian architecture in its various phases from Hindu and Saracenic art, the influences of the first Muhammadan invaders, and everything between and up to the seventeenth century. From that point he carries us right through the eighteenth century with the decay of the Mogul Empire and so on to modern Rajput architecture, Anglo-Indian architecture, architecture in the Victorian period, modern buildings, the future of architecture in India, and the building of the new Delhi. The author reminds us that 14 years ago the Parliament of Great Britain, the Press and the British public were discussing the issues raised in this book; the "Battle of the Styles" was the burning question; and he tells us the story of how the advice was ignored of a long list of petitioners who suggested that as a method of building (not one of styles) the main inspiration should be national as opposed to bureaucratic; that is to say, native Indian, and not that of the official architect's office, and that the new Delhi should arise as did Westminster Abbey, Santa Sophia and Saint Peter's at Rome, not to mention such buildings in India as the Taj Mahal, the palaces of Akbar and Shah Jahân. "This was the method that has produced all the great buildings of the world, and no modern buildings warrant the assumption that it can be safely departed from."

The author shows us over and over again that architecture is still very much alive in India; that stately palaces and noble temples, purely Indian in inception and fulfilment, have been reared in quite recent years which compare favourably with those of the admittedly great historical periods in Indian art; there are thousands of master-builders and countless thousands of artificers not only able and willing to carry out their own ideas, but fully capable of adapting their own ideals to modern requirements. "Nothing can be more unjust than the charge so often brought against the Indian master-craftsman that he follows blindly a stereotyped tradition which he cannot adapt to the changing conditions of the times in which he lives."

It is on the knees of the gods whether or no the buildings of the new Delhi may do something towards rectifying past errors of judgment in such matters and give a new lease of life to Indian artcraft.

We can with confidence recommend students of architecture in general and Indian architecture in particular to make a careful study of this book. The author's theory of the origin of the pointed arch of the mediæval Gothic of northern and southern Europe being found in the Saracenic architecture of India is an absorbing one, and we venture to suggest that a study of our own Gothic should commence with one of its primitive origin in Saracenic art. Chapter II, on the Taj Mahal, is neither the least nor the most interesting in a long series of fascinating studies which link the old with the new in the East.

* "Indian Architecture." By E. B. Havell. (London: John Murray.) 282 pp., 129 plates and 49 text illustrations and diagrams. 2nd edition. 4to, cloth, 42s. net.



GROSVENOR HOUSE FLATS
APPROXIMATE SITE PLAN.

Fig. 4.

(*See page* 625.)

MODERN CONSTRUCTION METHODS

Looking back over a period of twenty-five years, one is struck by the alterations which have taken place in structural engineering practice and in construction methods. The reasons for these changes are not difficult to find, and may be put down to (*a*) the increased use of steel-frame buildings with panel walls and reinforced concrete to replace the older type of building with massive brick bearing-walls, and (*b*) the advances in wage-rates since the war and the consequent need of labour-saving devices and machinery. In this article it is proposed to deal in turn with some of the principal building materials and review the alterations which have taken place in their use and erection.

Steel.

Twice during the period under review have the rolled steel sections been standardised and the use of the list of new standard beams and columns issued by the British Engineering Standards Association has led to much economy in design. The removal from the list of a number of sections which were seldom required and the improvement of the sections has produced a saving in rolling costs. Nowadays architects specify standard sections and there is no longer the delay and extra cost incurred when the mills were quite frequently required to change the rolls in order to satisfy the requirements of specifications which called for joists of the more uncommon sections.

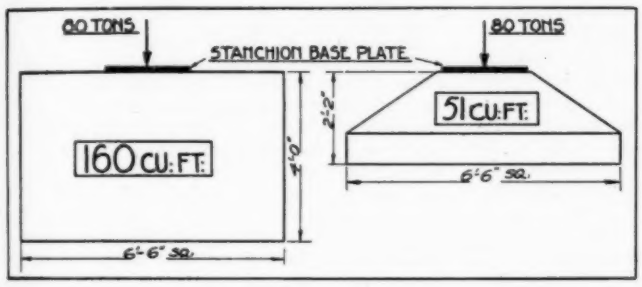


Fig. 1.

For columns carrying heavy loads cast-steel is coming into favour owing to the decreased sectional area which they require, and these can now be seen in course of erection on an important London contract. Another innovation has been the use of rolled steel slabs grouted on concrete foundations as bases for columns which have the advantage of giving simpler footing details than are possible when using built-up bases. This type of column foundation is frequently met with abroad, but is not yet common in this country. The best reason for their use is that the steel base-plate need not be so deep below the basement floor-level as when the built-up or cast-iron detail is employed. Considerable saving in material costs has been effected by the modern substitution of reinforced concrete footing slabs for the large mass concrete blocks of former days. Fig. 1 shows a modern and an old design of footing for the same column. Here there is a net saving of 109 cubic ft. of concrete by using the reinforced concrete type. Where grillages are used it is now the recognised practice to assemble these in the shops and transport them to the job, thus ensuring cheaper and better workmanship.

Although no striking alteration in constructional steelwork has taken place, it is not improbable that the recently introduced practice of welding connections to columns and joints in roof-trusses will spread quickly when architects and engineers obtain more data on the relative efficiency of welded and riveted joints.

Where foundations are required in water-bearing strata the modern practice is to drive steel sheet-piling round the site of the foundation. The excavation inside the ring of piling is then removed by hand or by a grab to a depth of about 5 ft., and timber settings (Fig. 2) are fixed. Then excavation proceeds below the frame until such a depth is reached that another frame is required. In such a cofferdam, using proper pumps and sumps to keep down the water-level the concrete foundations are poured, the timber settings being removed as the concrete level rises. Afterwards the steel sheet piles are withdrawn for use in another foundation. For such work steel posssses great advantages over the old-fashioned timber sheet-piles built up from three deals.

It is in steel erection rather than design that one notices changes. For straight lifts such as are required with roof-trusses the gin-pole is still in common use, but for the erection of high framed structures the stiff-leg derrick is now being replaced by derricks with a lattice steel mast, boom and bull-wheel. Extensive use is being made of portable pneumatic riveters, drills, grinders and chipping machines, with consequent saving in labour costs. For cutting steel, if required, on the site the oxy-acetylene blow-pipe is much favoured.

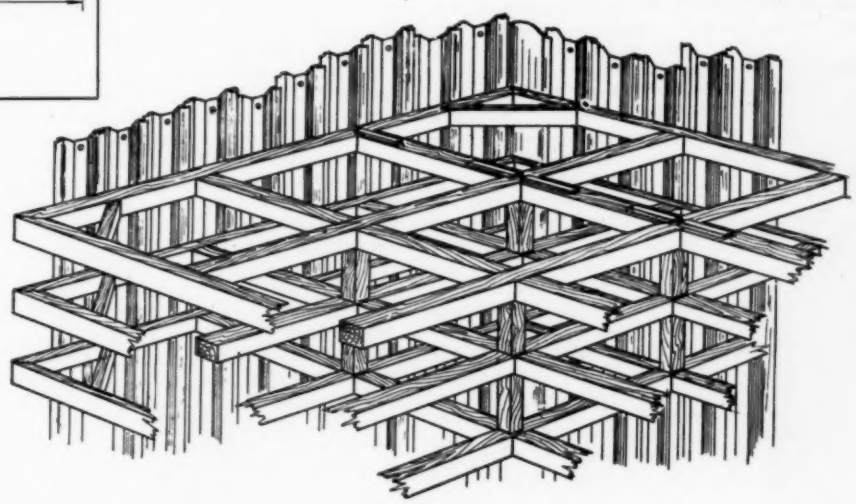


Fig. 2.

Roof Materials.

Considerable economy in construction has been secured by the introduction of corrugated asbestos sheets and tiles which, owing to the fact that their dead weight per square as fixed is only about 3 cwt. compared with "seconds" Welsh slates weighing 7 cwt. per square, require smaller scantlings for their supports than ordinary slates. With trusses at 10 ft. centres corrugated asbestos sheets only require 6 in. by 3 in. timber purlins every 4 ft. 6 in.

Another interesting feature in roofing and side-sheeting changes is the protection of corrugated-iron in such a manner as to resist corrosion of all kinds. For resisting impact and vibration heavy wired-glass is much used nowadays in factory ventilators and windows. Pre-cast gypsum-concrete slabs with a high resistance to the passage of heat and cold have proved a useful material for roof-covering and partitions in addition to reducing the dead load much below the minimum figure which is possible with some other materials.

Brickwork.

Although steel-framed and reinforced-concrete structures are now used to such a large extent, there are still structures, such as small workshops, houses, etc., in which brick-work is holding its own as a material for supporting the loads due to timber and steel trusses Brickwork still holds an important place from the point of view of architects whose interest is the appearance of the structure. Important advances have been made in the types of scaffolding which are now available, and the built-up scaffold is not now alone in the field. Tubular steel scaffolds with interchangeable members are now supplied by several firms, and for repairs to the upper stories of high buildings outrigger scaffolds supported on the floors or beams may be obtained for use where it would be too costly to erect scaffolding from the street level.

Improvements in methods of handling materials include the "container system" by means of which bricks are handled in bulk from the works to the job. In the United States of America cement is now loaded in bulk at the mill and forwarded in full wagon loads to the building site. In Great Britain, however, the tendency is to use more easily-handled units such as 1 cwt. bags or paper sacks.

Hoisting.

A casual observation of any important building contract nowadays will show that great progress has been made in the methods used for hoisting materials from the street level. Whereas formerly this was done by a gin-wheel it is quite exceptional to see one of these in use at present unless the job is a very small one. Hoisting concrete in a bucket using a gin-wheel cannot be done for much less than about 2s. 9d. an hour owing to the hoisting speed limits of about 30 ft. per minute and the large percentage of time which is spent in returning the empty buckets, taking them off and hitching on the full buckets. With power hoisting the speed is at least five times as great; the capacity of a cement cart is 5 cubic feet. as against ¼ cubic ft. for the bucket and the proportion of time when not hauling a useful load is much smaller. The cost per hour is about the same for labour but instead of hoisting only ½ cubic yard in one hour we can reasonably expect to hoist 27 cubic yards. Assuming that it were possible to hoist 27 cubic yards an hour by hand-power the labour cost would be 54 times as great as if a power-hoist were used and the hourly difference in cost would be about £6 dead loss. On a basis of a 44-hour week this loss amounts to £264, therefore in a very short time the power-hoist would pay for itself.

On large contracts a tower or mast with a distributing chute is almost universal practice on concrete construction works. Allowing for plant charges and installation costs this method of distributing concrete is always cheapest and is particularly suitable for

buildings which are square or rectangular in plan. In cases where the plan is ell-shaped two towers are generally erected.

Concrete.

Since the extensive adoption of reinforced concrete as a structural material immense strides have been made in the progress of concrete engineering, and our knowledge of the methods by which good concrete is produced has been largely supplemented by laboratory test-work. Ten years ago an engineer who specified that the concrete should have an ultimate compressive strength of 2,000 lb. per sq. inch at 28 days and did not state the proportions in which cement, sand and stone were to be mixed would have been looked upon as eccentric. The old method of specifying the mix in arbitrary proportions gave very erratic results under test, mainly because the amount of mixing water to be used was left entirely to unskilled labourers.

As a result of recent knowledge, the American Committee on Standard Specifications for Concrete and Reinforced Concrete in their Report recommended that a concrete of the desired strength be specified instead of stating definite and arbitrary proportions. This suggestion was a step in the right direction, since the engineer and architect are mainly concerned with obtaining a concrete that will be uniform and have the strength required, and not with the methods the contractor may use to obtain these results. It, however, threw the burden on the contractor and he was naturally sceptical as to whether it could be put into practice without undue hardship to him and increased cost. If he could see where he benefited he would be willing to try it.

Some of the larger contractors, on their own initiative and in co-operation with the engineer, tried out "field-control" methods on their work and compared the results and cost obtained with those obtained by the old methods. The results were so satisfactory that the use of control methods is rapidly extending throughout the country, and on important work at any rate it is now universal practice.

Arbitrary proportions do not take into account the voids or grading or sizes of the aggregate. No two samples of aggregate have exactly the same properties, and therefore standard results cannot be obtained by mixing any fine and any coarse aggregate in the same proportions. Even if the specified proportions are correct, the usual wheelbarrow method of measurement is far from accurate, and at the best is guesswork. The labourer will usually wheel as little as possible; on the other hand, some contractors will try to load on all the wheelbarrow will hold.

Also, specified proportions are based on dry compact aggregate, while in practice they will always be measured loose and will contain some moisture, especially the sand. A rainy day will thoroughly soak the sand, and it will retain the moisture for a long time. Wet sand will bulk or increase its volume as much as 30 per cent. with a moisture content of only 5 per cent. by weight. A wheelbarrow of sand may then contain any amount, depending on the ideas of the labourer filling it and on the moisture content. Coarse aggregate will also bulk when wet, but to a much smaller amount.

Constant supervision will not do much to change these conditions. Therefore an engineer specifying a concrete to be mixed, say, in the proportions of 1: 2: 4 is first of all assuming that the properties of the aggregates will be such that these are the best proportions to use; second, that they will be perfectly dry; and third, that the proportions will be constantly maintained on the job. Actually he will be getting a concrete that may be mixed in the proportions of 1: 1: 2, 1: 4: 9, or in any one of an indefinite number of combinations, with a corresponding variation in strength.

Nothing has been said yet about proportioning of the water. This is rarely specified, and is usually left to "the man on the mixer," who must have unknowingly governed the strength of many a structure. We now know the great importance of regulating the amount of water used in mixing, and that, in fact, other things being equal, the quantity of water will govern the strength obtained. How many engineers have carefully watched the cement go into each batch, and at the same time allowed the contractor to flood the mixture with water? Far better to have watched the water and left the cement alone! Excess water can easily reduce the strength of concrete 50 per cent. Unfortunately water is the cheapest ingredient, so the least attention is usually paid to it.

The design of concrete mixtures is based on the water-cement ratio theory. This is, that for given materials and conditions of manipulation the strength of concrete depends on the ratio of the volume of mixing water to the volume of cement so long as a workable consistency is obtained. Another way of stating the theory is that so long as the water bears a constant ratio to the cement the strength of the concrete at a given age is fixed, regardless of the quantity of aggregate added, so long as the mixture is plastic and workable and the aggregate clean, sound and durable.

Two things will be noticed. Strength depends on the ratio of water to cement only, while economy of the concrete depends on the amount of aggregate that can be added and still have a workable mixture, and this latter depends on the sizes and grading of the particles. Increasing the amount of aggregate will increase the volume or yield of the concrete produced for a given amount of cement and water. It is thus to the advantage of the contractor to design his concrete mixtures, for by so doing he can use the minimum amount of cement without sacrificing strength. The amount of water used in the mix being the controlling feature of strength, changing the amount of cement, the degree of plasticity of the concrete, and the size and grading of the aggregates only affects the strength through changing the amount of water required in the mix. The lower the water-cement ratio the greater will be the strength as long as the mixture is workable.

In no part of the construction field has machinery made more advances in replacing hand labour than in concrete work. We have already mentioned the introduction of hoisting machinery. Hand-mixing of concrete is now very uncommon except in the case of very small repair jobs where it would not pay to bring a mixer to the site. Concrete mixers are made of all types and sizes from the simple pot-mixer with an input of 4½ cub. ft. of dry material to the huge rotary machines which receive 2 cub. yds. of aggregate and cement. The smaller sizes are usually driven by a petrol engine, the larger by petrol, steam or electric power.

For work on one level a small mixer, with a crew of three men feeding it, the mixer man, two men wheeling concrete in special carts holding 5 cub. ft., and two men placing and ramming the concrete, has an output of 28 cub. yds. per day, which at 10s. an hour represents a labour cost of only 2s. 10d. per cub. yd. To this must be added the usual plant charges and the cost of petrol, which is about 2s. a day under ordinary conditions. Concrete carts are usually wheeled over runways of 2-in. plank, light joists or 12-in. by ¼-in. steel plates, and are much more economical to use than the ordinary concrete barrow with raised back.

BUILDING MATERIALS AND THEIR MODERN USES

An interesting example of modern methods in the erection of scaffolding is to be seen on a building some seven or eight stories high in Victoria-street. A scaffold of galvanised steel tubes of small diameter, it presents a spidery appearance in proportion to its height, but one cannot help recognising the advance over the old timber poles, putlogs, rope lashings, and slow method of construction as one watches the quick hauling up of the light tubes to the top of the building and the ease and quickness in assembling them. The progress made in scaffolding applies equally to the constructional side of modern buildings. In the old days, a builder when signing the building contract for a large building could not tell whether the building would be erected within the agreed time or not. The work usually progressed in easy stages until one morning the builder woke up to the fact that if the building was to be finished in time a move would have to be made, and instructions were given to the foreman that certain portions had to be finished by a certain date. Even extra labour and longer hours often failed to achieve the object in view, with the usual trouble and claims between owner and builder. It is a sign of the times that this method is gradually giving way to an organised system in the erection of modern buildings and where large financial interests are at stake it is essential that some such method should be employed in order that the building may be completed within the stipulated time.

The Americans have for some years employed a time-table system worked out on the basis of material used and time for its erection. Each part of the building is then scheduled for commencement and completion within a certain time, and this system has been so perfected that under normal conditions buildings have been completed within a few hours of the contract time. This system is being gradually adopted here, and its use will no doubt become general, as it means economy and efficiency in the capital and labour employed upon large or small contracts. The advent of the steel-framed building has greatly influenced the changed methods of present-day construction, and has contributed in no small way to rapidity in the erection of modern buildings. The steel frame enables the exterior walls and internal work on several floors to be carried on simultaneously, and has been responsible for the introduction of new materials or the improvement of older materials in the construction of buildings. Cement a few years ago required days and even weeks to set and reach full strength, but this material can now be obtained to set and harden so quickly that where employed in street works the heavy L.C.C. tramcars have been running upon the track where less than twenty-four hours previously excavation was still in progress. The use of such cement in the concrete for foundations enables heavy loads to be placed upon them the next day.

Concrete, with steel reinforcement, is largely used in constructional work, but if time is the essence of the contract, concrete, if used, must be in a ready-made form, otherwise the use of centering retards the rapid erection of the work. Among the many excellent reinforcements for concrete floors is a new one of dovetail grooved sheet steel. The sheets are made up to 10 ft. in length and of various gauges, from 26 to 16 gauge. A sheet of 26 gauge 6 ft. in length with a layer on the upper surface of 2 in. of concrete will carry a load of 7 cwt. per foot super with a deflection of ¼ in. This deflection is reduced if the underside is plastered or the thickness of the concrete increased. The sheeting being solid, acts as

its own centering and reinforcement, allows very little water to escape to the floor below, and if a quick-setting cement is used, work can proceed upon the floor within twenty-four hours of being laid. Solid or hollow floors can be constructed with this material, and the first coat of plaster can be applied to the material before fixing into position.

The possibilities of the use of terra-cotta are revealed in a book on "Terra-Cotta of the Italian Renaissance," published by the Terra-Cotta Association. The manufacture of terra-cotta has improved so much that large blocks can be produced without any twisting or shrinkage, and its durability renders it an excellent material in districts that have injurious or blackening effects upon brick or stone. The internal surfaces of walls can now be covered with a variety of materials. Plaster still holds pride of place as a wall covering, both plain and decorative. Many substitutes, however, such as the composite boards, three-ply wood panelling, are efficient and have the advantage of being capable of decorative treatment as soon as fixed. Many kinemas and business premises are using stamped metal ceilings. These can be obtained in a variety of designs, and in addition to having the effect of ornamental plaster work, are fire-resisting and quickly fixed into position. Wall-tiling is effectively carried out with metal tiles, some stove-enamelled, others coated with a hard decorative material in any desired colour. The tiles are made in various sizes and are fixed with cement in the ordinary manner.

For general roof coverings, in addition to our well-known resources of slates and tiles, we now have the Marseilles and the Courtrai patterns, which are cheap as well as effective.

There are a variety of floors upon the market which do not require centering, or at the most a few temporary supports. Many are concrete with special reinforcement, and others are of burnt clay, hollow in construction, the clay blocks being reinforced with flat bars between the rows.

For speed in erection and quick utility, these floors possess great advantages over the old type of wet concrete floor requiring a temporary wood shuttering. Floor coverings can be of various kinds—the ordinary cement-finished floor in its natural colour or coloured to any tint by the addition of a colouring material in powdered form; the jointless floor, formed of sawdust or wood flour and magnesite; the wood floor in hard or soft woods; the tiled floor; and the rubber or cork floor, etc. The difficulty of forming a tiled or mosaic floor upon wood joists can be overcome by the use of metal sheets nailed to the joists, floating in cement, and laying the tiles thereon.

Economy in floor space entails the use of materials that will form a thin but efficient partition. That in general use to-day is formed of breeze blocks, generally about 2¼ in. thick, with a plaster-finished thickness of about 3 in. An inch or 1½ inches reduction in the thickness of partitions means a considerable saving of floor space in a large building. Such partition can be formed with perforated metal sheeting or wire mesh specially covered with terra-cotta buttons, and these materials, when plastered both sides, will produce a partition from 1½ in. to 2 in. thick. Other partitions can be formed of specially made fire-clay blocks plastered on the surfaces, or, if required, they can be obtained with glazed surfaces. Larger-size hollow fireclay or breeze blocks are used in many districts for the exterior walls of houses or one-story factories where no great weight has to be carried, and rendered or otherwise treated on the outer surfaces, produce a wall which is weather-proof and of equable temperature, owing to its hollow construction. Some concrete blocks can be obtained with a hard concrete exterior surface and a porous concrete interior surface, thus preventing, when plastered, the trouble of condensation experienced generally with hard, concrete walls.

Windows until the war were usually constructed of wood, but with the advent of the housing schemes a well-designed steel window was produced of good proportion and obtainable with or without bars. Many people preferred these steel casements in a wood frame, and some makers have now produced a wood frame that should fulfil all requirements. The sashes can be glazed with large or small squares or with lead lights. Those who can afford the extra expense can have the windows on the sunny sides glazed with the new glass that allows the ultra-violet rays to pass through. Casement doors to match the windows can be obtained in metal. For more pretentious buildings, doors or windows can be obtained in steel or bronze to design.

With the advent of the motor-car it is essential to provide a garage to the suburban house. In new houses the garage can either be part of the house or made a separate building. Where it is inconvenient to have doors hung upon hinges, one of the many sliding gears upon the market will enable the doors to fold back or to slide back against the face of an inner wall or roof. Ball-bearing turntables can be provided if necessary.

The floor over the garage should be made fire-proof or fire-resisting, and this can be readily accomplished by the use of one of the self-centering metal reinforcements and concrete, or, if wood joists are used, the ceiling can be formed of asbestos sheets or stamped steel. A separate building in the country usually presents no difficulty so far as available space is concerned, but in London and other towns the use of ordinary brick walls and footings would often render the available width of space useless for the purpose. The use of rigid metal reinforcement as mentioned will prove suitable for this purpose, enabling the floors, walls, and roof to be made with cement not more than 2 in. in thickness and meeting with the approval of the local authorities.

Not many portions of the joinery to a building cannot be standardised, and such items as doors can now be obtained in many designs and shapes, with the advantage that shrinkage has practically disappeared. For housing and similar repetition work the door hung in frame, with lock and furniture complete, can now be obtained in one unit ready for fixing in position. With the disappearance of the old kitchen range and boiler, alternative methods have been adopted for providing a hot-water service to the house. This can be arranged by having a small independent hot-water boiler to burn coke, anthracite, etc., or the newer type of gas-heater which automatically turns on the gas when the tap is turned on, and, the water supply being under pressure, allows the hot-water taps to be placed in any part and on any floor, and hot water can be obtained at any time during the day or night. Copper service pipes are largely used in the northern part of England and in Scotland, and are of light weight and provided with simple joints quickly connected.

The introduction of cellulose paint and its use on motor-cars is being followed by its use upon buildings. Depositing a thin coat of celluloid of any desired tint, this paint covers any wood or iron work with an impervious coat that hardens as time goes on. It has an eggshell gloss, great covering power, and does not show brush marks. On large surfaces it can be applied with a spray and dries within a few minutes.

BUILDING RESEARCH

Dr. R. E. Stradling, M.C., B.Sc., Hon. A.R.I.B.A., Director of the Building Research Section of the Department of Scientific and Industrial Research, read a paper recently at the R.I.B.A. on this subject, entitled "Balbus Built a Wall." The paper was the Bossom Gift, 1928, and was delivered under the auspices of the Chadwick Trust. Mr. Alfred C. Bossom, F.R.I.B.A., was in the chair.

The lecturer said that he had used the title in the hope that it might bring to mind two things—first, the great age of our building industry, and, second, the problem of wall construction. He wished to analyse what he considered to be the present position of the industry (partly through a consideration of the past) to outline some of the present-day troubles, and to make suggestions for future progress. At the Building Research Station it was, said the lecturer, his duty to organise the work of his colleagues so that they could as a team apply scientific investigation to the solution of problems arising in the industry. Such efforts could not be successful without the help of the practising members of the industry. With the object, therefore, of securing that co-operation, he was taking the opportunity of putting forward the point of view of those working in the field of applied science. In the dim ages of the past, said the lecturer, the first walls to be erected were no doubt merely unpretentious screens of brushwood or piles of stones put together for the purpose of providing shelter from the weather. The rendering more efficient of these rough brushwood screens by the filling of interstices with mud and clay led to their development into "wattle and daub" and the heaps of stones into masonry and other types of wall depending upon the materials available in the district. Man, however, had many enemies—he was open to the attack both from wild animals and from other men like himself, and the need for protection was a factor which had considerable influence upon the development of more advanced types of wall construction.

It was that defensive purpose of the wall which accounted so largely for its massiveness, though other factors tended to produce the same result. Walls built unscientifically, *i.e.*, without adequate bonding, had necessarily to be massive and heavy so as to attain by sheer weight the strength that might be obtained otherwise by skill and scientific arrangement. The materials used for these early walls were local, and each man (or family group) was his own designer and builder. Cost in the modern sense was no consideration, though the magnitude of a job must have been limited to what could be done in a reasonable time with the labour available. No doubt, the failures of weak walls through lack of proper bonding were many, but some idea of the correct placing of wall units arose from these trial and error methods, and ultimately the "bonds" of the present day were developed. Although in some parts of the world the science of wall construction was still unappreciated, yet in other civilisations a very high state of development had been revealed even thousands of years B.C. Squared stones, sun-dried and kiln-burnt bricks, etc., were used, with mortar of bitumen or clay or calcareous earth. In those older civilisations, such as the Egyptian, Babylonian and Assyrian, Greek and Roman, captives, prisoners of war and slaves were very largely used for public works and buildings. The labour costs in those days must have been of very little consideration, and, judging from the immense thickness of the walls, etc., likewise with the cost of the materials. The Assyrian Sculptures were interesting as showing the large numbers of forced labourers working under task-masters on public works, and some idea of the immensity of the tasks was given, for instance, by the calculations of Rawlinson, who estimated that the great platform upon which were built the buildings of Nineveh required the labour of 10,000 men working for twelve years before the buildings

were even commenced. As far as England was concerned, in pre-Roman times its chief walling materials were presumably timber, mud, etc., though in some parts of the country there must have been considerable skill in masonry: the uprights of Stonehenge, for instance, having tenons worked from the solid, which fitted into mortices in the horizontal lintels. The Romans introduced more advanced construction than was previously here in vogue, and masonry and brickwork were widely used for walling purposes. Massive walls were used for defensive purposes—*e.g.*, Hadrian's Wall and the walls round their cities or forts; but, in addition, attention was paid to other properties than strength. Architectural effects were sought, beautiful buildings were erected, and internal plastering and mural decoration were usual in good buildings: a highly developed craft procedure was in full swing. One interesting feature of their wall construction was the use of pozzolanas for the making of mortars and concretes. These pozzolanas were sometimes volcanic earths, and sometimes burnt clays, tiles or potsherds, and many of the resulting mixtures were in a very good state of preservation at the present time. When the Romans left, the art of brickwork and masonry in England seemed to have been allowed to disappear, and with it the use of pozzolanas. During Saxon times, the traditional timber and mud construction was reverted to. About the time of the Norman Conquest or a little earlier, masonry work was reintroduced into England from the Continent. The influence of the traditional timber construction was apparent in such buildings as the Saxon tower of Earl's Barton Church. In the early Norman structures one of the chief characteristics was the massiveness of the walls. The thrusts of vaults were balanced generally by the weight of these walls, and it was not until later that the Gothic builders developed the more scientific use of buttresses and enabled the construction to be lightened. Yet this enormous advance was made by trial and error methods and new traditions of masonry work founded. In the meantime the walls of ordinary houses were still timber or mud, even in stone districts, and it was only abbeys, churches, castles and such buildings which had walls of masonry. The defensive purposes of castles and of the more important houses still influenced the construction of their walls and largely accounted for their massive nature. It was not until later, with the discovery and development of gunpowder, that such traditional forms of defence became ineffective and ultimately useless. Thus one of the traditional demands upon the builder gradually passed away. In its place, however, arose other demands, for the more settled conditions in the country enabled more attention to be paid to buildings for domestic and trade purposes. Gradually better weather protection and a higher standard of general comfort replaced the older military demands. Up to the seventeenth and eighteenth centuries, when it became fashionable in this country to employ classic features in all buildings which had any pretence to architecture, it seemed probable that the architect and the master builder were one. The Renaissance, however, demanded from the architect a knowledge of classic details, and since reading and writing were accomplishments which only the few possessed, the architect was recruited rather from these than from the actual builders. At any rate, the gulf between the craftsman and the designer became wider from this period. With the so-called "industrial revolution," quite new demands were made upon the industry. The growth of our bigger towns brought about not only an intensive demarcation between professional men and craftsmen, but also a lack of craft pride and the growth of the small, ill-trained "jerry" builder. As far as one could judge, the mental attitude of the "jerry" builder was only typical of this period, but he was remembered so clearly because his achievements had been brought home to most of us! One other interesting development was worth noting. With the decline in the demand for fortified dwellings and the gradual spread of more peaceful conditions, the need arose for easier communications. This meant bridge-building, and so the building industry had to create a group of specialists to cope with the problems of structural engineering. Up to this point only the growth of industry as brought about by new demands made upon it by the needs of the community has been considered, said the lecturer. But there was another very big factor in development—the introduction of new constructional materials. Such an introduction came, for example, with the advent of the structural engineer. Iron and, later, steel, became available and revolutionised bridge work and, in fact, constructional engineering work generally.

He would say, held the lecturer, that the general demand made upon the industry was to ask it to organise to take advantage of certain laws of nature to enable materials to be so placed as to serve a useful purpose to the community. But in more detail we had to examine briefly what those "useful purposes" were and under what economic conditions the builder must work, and the discussion would be continued with the wall as a typical building unit.

Modern civilisation demanded that most walls should act as protections from the weather conditions, and though, of course, other specialised demands were made, by far the majority of walls had that as a first requirement. In addition, the appearance both internal and external was of considerable importance, and in England, at any rate, lasting qualities were desired. Those comprised the chief technical demands, but the overruling factor was the economic demand for cheap construction. Very few would doubt, thought the lecturer, that with unlimited funds, walls could be built as efficiently and good as any that had been built in the past. In the demand for economy in building the industry had been offered and accepted many new materials and processes. Owing to the lack of

Fig. 2.

scientific knowledge both inside and outside the industry, it had not been possible to examine critically these new suggestions before trying them on works. In other words, the industry had had to test them by full scale experimentation. Everyone knew what failures had resulted from some of those trials, and that such failures had in the end to be paid for by the community.

The traditional methods of wall construction had grown up over thousands of years and had been developed by trial and error methods. Such methods had one great technical disadvantage: the result obtained by practical test of a material or construction only applied to the actual case tested, and could not safely be applied in any other case where the conditions were not *precisely* the same. Unless the results of tests had been obtained from experiments which analysed all the conditions affecting the results, those could not be safely applied in different cases. Such experiments could usually only be carried out under the carefully controlled conditions of a laboratory. The majority of failures, major and minor, were due to a disregard of that principle. Attempts were made to use traditional methods with materials different from those in use when the methods were developed or in positions or for purposes also not traditional.

When one was faced with the problem of analysing in detail the reasons for some of these failures one immediately met with the difficulty that it was not known why the traditional methods were satisfactory. Hence at the Building Research Station two main divisions of work existed, (1) the bringing together of organised knowledge as to why traditional methods as originally worked out were satisfactory, and (2) the analysis of the reasons for present-day troubles in the light of the organised knowledge collected under (1). In a previous paragraph certain demands on walls were noted, and it was now proposed to deal with these in more detail. These demands were stated as:

(1) Weather protection.
(2) Suitable external appearance.
(3) Suitable internal appearance.
(4) Lasting qualities.
(5) Economy and cheapness in construction.

The chief considerations as regarded weather protection, at any rate in England, were: (a) protection from rain, (b) protection from temperature changes. The first of

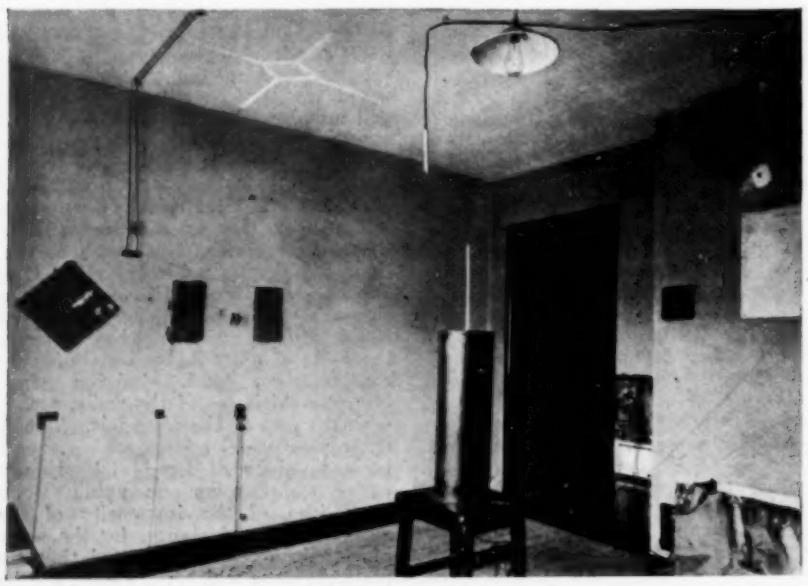


Fig. 1.

these was really not difficult to secure, although in the early attempts of engineers to use steel framing and a concrete skin in some of the methods suggested for small house construction since the war had resulted in anything but rainproof walls. Many other "alternative methods" for that particular purpose had produced similar results, but considered generally the difficulty of meeting that requirement had not been as great as that experienced in trying to comply with some of the others. The second demand, that of walls capable of giving reasonable heat insulation, had been more troublesome when departures had been made from traditional practice either in methods of construction or in methods of heating. It had not been realised, for instance, that although air was a good insulator under certain conditions, such conditions were not always supplied by a cavity wall with thin outer and inner skins. Methods of central heating were all departures from traditional English practice, and had brought difficulties, some of which even now had not been solved. Enough attention had not been given to the effects of radiation, and it was still extremely difficult to convince people requiring tests on new forms of construction consisting of thin skins that the major heat transmission effects were often those of radiation and not conduction. Even now it was not possible to analyse all heat losses from a room in a strictly accurate manner. Much more scientific work was required, and some of this was being attempted at the Building Research Station. In Fig. 1 was shown the inside of a room in the Experimental Cottage at Garston. In the foreground was the control for the supply of heat to the room. It was a kind of dummy man whose "skin" temperature was kept constant, corresponding to a measure of comfort. Heat passed either to him or from him (a) by radiation, (b) by convection. If the walls, for example, were at a lower temperature than his "skin" then he radiated heat to them, and hence his own temperature tended to drop. By a thermostat control inside more heat was allowed into the room until the conditions were again adjusted to keep the dummy's "skin" at the predetermined temperature. The inflow of energy into the room was measured, and the apparatus seen on the wall was that designed to measure the losses through various portions of the walls. It was not possible in a short space of time, said the lecturer, to give detailed descriptions of those, but in general they consisted of instruments to measure losses by radiation and those by air convection, and also the temperature gradient through the wall itself.

Such work was rendered necessary in order to understand what were the heat requirements of a room and how to examine and compare any new or old form of construction from that point of view.

In considering that demand of external appearance it was convenient to consider at the same time the question of durability. Everyone in the industry realised the troubles met with under this heading. The preservation of the appearance, and sometimes the strength also, of existing buildings had become, said the lecturer, a national problem of some magnitude and of the greatest difficulty. The expression of artistic forms in constructional materials was often attended by failures to produce any degree of permanence in the structure. Let them examine a few simple cases. Fig. 2 was an example—certainly not of a beautiful building—but of an interesting case of efflorescence from stock bricks. The structure consisted of storage bins for sand and gravel. The sand was wet when placed in the bins and the moisture passed through the brickwork to the outside of the wall, but in so doing carried certain salts present in the bricks to the surface. The salts did not come

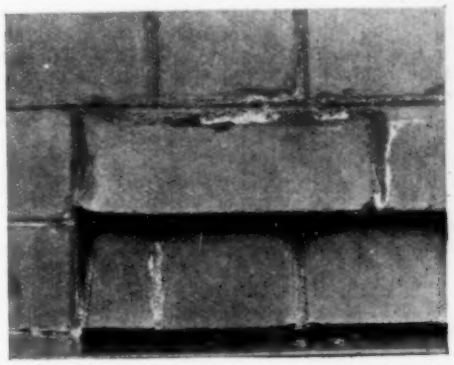


Fig. 3.

from the sand. This kind of thing was disfiguring, but in that case not permanently so, for after a few rain storms the efflorescence disappeared and the brickwork appeared to be quite sound. Let them compare this effect with that shown in Fig. 3. There were depicted some smooth-faced engineering bricks on one of the railway retaining walls at Hampstead. Here again was efflorescence, but here the brick was actually breaking up. This brick was much harder and stronger than the stock brick, yet the stronger decayed whilst the weaker did not. Why was this? We did not know. This illustrated one of the most difficult problems in the work of the Building Research Station. In the lecturer's opinion, when we knew the answer to this we should have gone a long way towards the solution of the general problem of weathering and decay of stonework, etc. One more example, but this time of a really fine building, erected almost regardless of cost. Unsightly efflorescences were appearing around all the joints and a close examination showed signs of incipient decay of the stone. The lecturer had the opportunity of discussing this with the architect concerned and knew that every precaution had been taken that traditional practice could suggest. Every care was taken to stick closely to traditional materials, both for mortar and stone, yet this was happening after very few years' exposure. Why was it? Again we had to admit we did not know. In some way the mortar and the stone were incompatible. There were buildings in existence of the same stone which appeared quite sound after many years' exposure. Obviously there had to be some factor different in the case referred to. At a guess he would suggest that probably both the stone and the mortar were different from the products sold under the same names 100-200 years ago, and hence even very close and particular attention to tradition could not bring about the traditional result. That problem of unsuitable association of materials was met with on all sides in the industry, especially when new materials were employed. One had only to bring to mind the troubles experienced with repointing old walls and the consequent decay of the stone which sometimes occurred, to realise how universal was the problem.

Perhaps no trouble was so common in the industry to-day as those concerned with the internal linings of walls. The number of plaster failures reported to the Building Research Station was very large indeed and the causes were usually either bad craftsmanship or lack of uniformity of new materials. Perhaps the majority were due to the materials. The traditional plastering medium was lime, but the demand for the speeding up of work gave great impetus to the use of sulphate plasters. These were not traditional materials in England, at any rate to the extent to which lime was, and in addition there were proprietary articles sold under trade names. Purchasing under a trade name was, after all, a guarantee of nothing except the faith of the purchaser in the vendor.

A manufacturer of a specific material which was sold merely under a trade name was under no obligation to provide exactly the same article each time. In fact if he was progressive he would probably seek to improve his material, both as to more economical manufacture and suitability as a plaster. Unfortunately the manufacturers' idea of requirements as a plaster and those of the plasterers might not be the same. One of the commonest methods of use sanctioned by tradition of very few years' standing was the mixing of various plasters and/or lime to give a workable mix. A certain mixture might have been found by experience to suit a certain purpose but such practice would be completely upset if one consignment of a specific plaster differed from a previous one, although that fresh consignment might in itself be an improved article if used alone. Such troubles had been repeatedly reported to the Building Research Station. Another quite common trouble was shown in Fig. 4, which was actually a paint failure. The case shown was that of an internal partition wall of breeze blocks covered with cement rendering and painted after three weeks. The paint stood up for three months and then failed due to condensation of moisture from the atmosphere. Painting on plaster work was a great source of trouble, and here again the trouble arose with certain proprietary plasters sold under trade names and which varied slightly from alkaline to neutral or faintly acid. Paint would be affected by the first but not by the other two and under present conditions the builder did not get any warning till the failure had occurred. A very elementary knowledge of chemistry would enable such alkalinity to be detected, in fact the almost blind use of one of the standard indicators such as phenol pthalein would give the information required. Yet such failures often occurred.

Already something had been said, declared the lecturer, about the lasting qualities of wall surfaces, so perhaps all that was necessary was to draw attention to certain structural failures of a rather different kind. He would exclude foundation troubles and take one example of a failure due to the use of quite a modern material. It was well known in the industry that, although quite sound concrete could be made with clinker or breeze as an aggregate, yet there had been large numbers of failures. Fig. 5 showed an example of this in the case of small house construction. In this particular case a group of eight houses was affected. The walls consisted of 6 in. poured concrete, with clinker as an aggregate, and

Fig. 4.

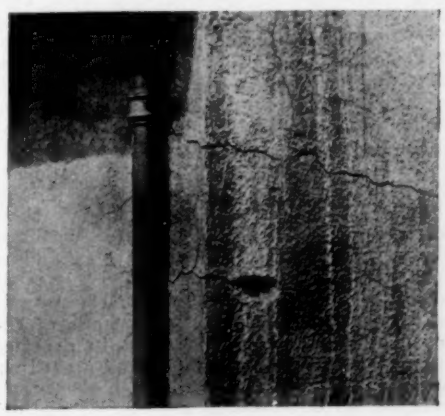


Fig. 5.

having a cement rendering on the outside. The clinker concrete expanded and cracked the rendering. The cracks were repaired, but the expansion continued until the houses became structually so unsafe that the tenants had to leave. Very many similar cases had been reported, and the Building Research Station had been trying to devise some means of distinguishing between good and bad clinkers for that work.

The lecturer was glad to be able to say that those efforts had been successful as far as laboratory tests are concerned and that there was every hope of an efficient and simple works test being available in

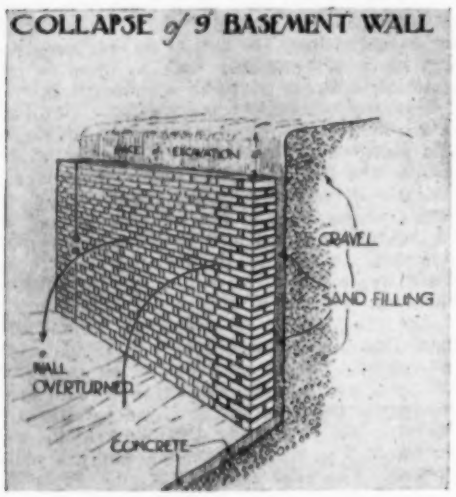


Fig. 6.

the near future. It would be realised that this use of clinker was quite a modern problem. The industry had had offered to it a cheap and light aggregate and started to use it. Sometimes great success was attained and at other times failure. That was a present-day example of full scale experimentation and the development of a traditional building material. What the end would be was hard to see. Should we ever have obtained a traditional method of choosing between a good and bad clinker just by practical experience? It was doubtful, for the tendency amongst architects and builders recently had been to forbid the use of clinker. By laboratory research it had been possible to sort out the reasons for the troubles and to distinguish suitable from unsuitable material. The most serious demand made on the industry at present was that for cheapness of construction. This was often called economy, but it was obvious that cheapness and economy were not synonymous terms. With an industry whose methods were traditional and were developed when both labour and materials were easily obtained, it was quite possible that the standardised methods were neither the cheapest nor the most economical. The outcry against the "jerry builder" was really one against variation from traditional practice, where the variations were an effort towards cheapening the first cost without sufficient regard to the efficiency of the finished building or its maintenance. A period of "jerry building" had of necessity to occur when full-scale experiments were made on the possibilities of cheaper construction, if such experiments were not designed and controlled with a full knowledge of the underlying science of building. Such full knowledge did not exist, although frequently very much more existed than was employed by the present-day builder. The demand made upon a traditional industry like building by the post-war housing conditions could only be met in the way in which it had been met. Thousands of experiments had been performed in practice in order to find a more rapid and a cheaper method of construction and, in the lecturer's opinion, no outstanding alternative method of construction had been evolved which could be said to have thrust the standard methods of construction into the background. The designers of new forms of construction had not realised all the factors involved, had had to deal with new materials whose properties were not known and had had to organise craftsmen not trained in any but traditional methods to handle those new forms. He did not wish to suggest blame on the designers for that state of things. It was the natural condition of an industry founded upon tradition alone. If building research had been started 30—40 years ago and the education of the industry developed on scientific lines parallel with the progress of research we might by this time have been in a position to know the underlying reasons for our difficulties.

This brought him, said the lecturer, to one of the main points he wished to press. The State had initiated research work for the industry and this was being more and more supported by manufacturers of various building materials, but no start had yet been made with the essential scientific education of the industry. He wondered whether it was realised how urgent this was. He had tried to indicate one or two points in building research and how an effort was being made to develop a real science of building, and had tried to show how in two cases, clinker concrete and the post-war housing work, the industry had endeavoured in our own time by practical full-scale experiments to answer demands made upon it by the community. He had tried to show how and why those experiments failed. The building research work had managed to get solutions of several problems connected with materials, but he felt certain that neither building research alone nor the industry *as it now existed* could hope to adjust in any reasonable time the traditional methods to bring about cheaper and more economical construction.

From the standpoint of the community at present there could not be said to be very much real economy in building. We were groping in the dark, trying to develop our industry by its traditional method of practical experiment and every failure was a charge on the community directly or indirectly. The last report of the chief Inspector of Factories and Workshops (Home Office) was rather disturbing, for, on page 12 the statement occurred: "Building again comes first among all industries as causing the greatest number of deaths, and docks follow not far behind." This referred, of course, to accidents reportable under the Factory and Workshops Acts. He had not, said the lecturer, got an analysis of these building accidents, but he had looked through the Building Research Station files of accidents connected with walls and had picked out three typical cases, and the next three figures (Nos. 6, 7, 8) illustrated these.

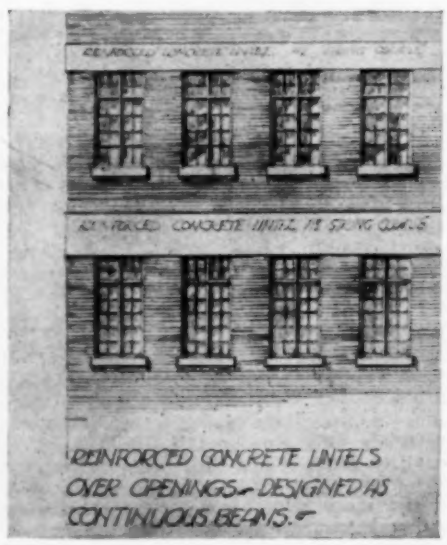


Fig. 8.

In figure 6 was shown diagrammatically the case of a basement wall which overturned during construction and caused the death of a workman.

An excavation about 25 ft. long was dug for the basement of a commercial building. The final wall construction was to consist of 9 in. brickwork against the earth with an inner wall of reinforced concrete. When complete, the structure would, of course, be amply strong enough, but during construction the 9 in. brick wall was built as shown, and as the courses were gradually laid the space between the back of wall and the excavation was packed with sand. The weather was wet and the ground surrounding the excavation drained into the sand filling. As the water rose in the sand a pressure was ultimately produced which was sufficient to overturn the wall and cause the accident. At the inquest held, the verdict was death by misadventure, and in the present state of the industry no other conclusion was possible. But that did not relieve the community from some responsibility for that man's death. Knowledge did exist, said the lecturer, which if applied might have rendered the accident impossible. In Fig. 7 was shown an example of a scaffolding failure. It showed quite a common difficulty. A heavy overhanging cornice had been designed and no anchoring apart from superimposed loads from the wall above was specified. Hence this heavy stonework had to be supported from a scaffolding until sufficient work had been added above to make the ornament stable. There were windows above and below, and due to the presence of the lower window openings the putlogs could only be given a bearing in the piers between these. As would be seen from the diagram, the outer ends of the cornice were supported from the planking on piers of bricks, surmounted by wedges. For some reason the scaffolding collapsed, killing one or two men. At the inquiry the balance of evidence appeared to point to the failure of a putlog, but there was obviously a large number of possibilities. The deflexion of the planking, either due to men walking about or due to unloading stone or other heavy material on to the platform which might easily have upset the equilibrium of such a supporting device as described. In Fig. 8 was shown the elevation of a portion of a wall which collapsed, and in the general smash five men were killed. The elevation of the building showed a stringcourse of reinforced concrete running round the building and acting as lintols over a series of window openings. Into this stringer course ran the beams of a flat reinforced concrete roof. The shuttering for the lintol beam stringer course was partly supported on the brick piers between the windows. There were a number of contributing causes to the failure, but the primary one was the removal of the supports of the lintol beam at the brick piers, thus making the series of

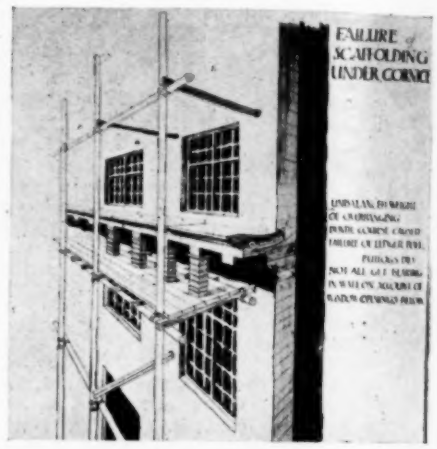


Fig. 7.

(*Concluded on page* 657.)

"THE BUILDER" DEBATE

MODERNISM IN ARCHITECTURE.

Sir,—The "modernist" doctrine appears to be built up upon three fallacies:

(1) That anything designed with a prototype is copying;

(2) That this generation has changed its way of living to an unprecedented degree; and

(3) That concrete construction is the building method of the present and of the future.

"Positive" is evidently a typical "modernist."

It would be interesting to know whether this school of thought writes down the Renaissance masters as copyists, because it is difficult to see how our approach to architectural design is so widely different from theirs, and it is some comfort to know that if those who disparage us are consistent, we are in fairly good company. Actually, of course, this talk of "copying" is rather beating the air, for by far the larger number of great modern buildings have no prototpye to copy from, and all that one follows is a sort of language to make them architecturally intelligible. There will be forms and features which have been done before, just as there are manners and customs in life, which we adopt from previous generations. Some of these forms and features may have lost their origin, just as many of our customs arise out of nothing but custom, acquiring a meaning often entirely different from the circumstances which called them forth.

The primitive man grasped the right hand of a friend as a sign that neither carried a weapon. We give the handshake as a mark of friendship, though we have no fear of bodily harm if the gesture were ignored. The modern agnostic says "Goodbye," once a pious hope that God would remain with you, now to him no more than an expression of good will. The modern agnostic who says instead, "Toodleoo," must surely be of the Corbusier school. Our lives are full of these memories which remind us of our history, and are the richer for them. If we were to sift them out and discard all that were not directly called for by the moment there would be little but bare bones remaining.

The extent by which we have changed in the last generation or so is vastly exaggerated. No doubt there have been wonderful inventions, and we live differently from our fathers in many respects. But this is no fresh phenomenon at all! History abounds with mild revolutions in habit, but such incidents do not imply for one moment a throwing over of all that has been done before. Modern building methods are not, after all, so different from those which have served in the past. Reinforced concrete itself is only an application of post and lintol, cantilever, truss, and arch, all of which are the primitive forms of construction, varying only in scale and material and capable of expression in similar forms. Why not?

This mention of reinforced concrete brings us to the third fallacy, that assumes modern building construction and concrete construction to be one and the same, in spite of denial which "Positive" makes, somewhat half-heartedly. This has yet to be proved, and I believe that a reaction against concrete construction as at present conceived may be not long distant. At any rate, if we exclude the larger type of building, we shall find that extensive concrete construction plays a very small part in the building of a modern house, and that if we further exclude the use of pre-cast concrete blocks, which differ in small degree from blocks of stone, the amount of concrete construction proper is very small indeed. When we consider house building, of which the bulk of building enterprise is devoted, we have to provide outer walls that will keep out the weather, keep down changes of internal temperature, maintain a reasonable standard of quiet within, and meet various other requirements. I have yet to meet any form of concrete construction that fulfils all these requirements economically, unless it is in the form of thickish blocks, involving no revolution at all in building method. Ninety per cent. of the walls of our domestic buildings are constructed in methods very little different from those of the last nine hundred years and more. And yet the modernist asks us to stamp all our buildings with the mark of methods which have yet to arrive, let alone prove themselves!

"Positive" is very scornful of our "Georgian" blocks of flats. I take it he refers to a type of building that is expressed as a brick front with an orderly range of sash windows, probably a simple cornice and tile roof, and a fine doorway of classic type. Can he tell us in what way this type of building belies our way of living or our way of building? I have yet to learn that the horizontal window pane is in any way more sanitary, or more easily constructed than the vertical, or that the sash window is not as efficient a fitment as any other. The cornice and doorway I will not excuse, but if we are to rule them out, we must forgo the meaningless handshake, and leave unspoken the insincere "farewell" to those who may fare as they please so far as we are concerned. We must even cast off our clothes because trousers and boots have been worn before by people who lived differently from our way!

Sincerity is an excellent quality if it is not carried to a point that will admit no playfulness, no humour and no fancy, for this is what it means when "Positive" declares that "extraneous ornament must be abolished, and we must go back to first principles in architecture." The fact is that we are so constituted that we cannot go back except in decadence. Architecture has always developed by adding to what has been done, discarding naturally, not by deliberate intention, that which has played out its part.

I think it is just the deliberate destructiveness of the modernist movement that exposes its falsity. It is all against the lessons of history. The pointed arch marked a revolution in building, but it did not arrive as a sudden new chapter in which the round arch was thrown upon the rubbish heap, but it just grew naturally into building method. The Renaissance was truly a sudden acquisition of knowledge, but the Renaissance in architecture took generations before the Gothic elements entirely disappeared. That is the way the modernist movement must arrive—somewhat more humbly and patiently than it now attempts.

Why should the modernist applaud the deliberate outrage of traditional structural expression, and yet criticise the classic column standing on plate glass? Why should he condemn the classic form because its meaning is only abstract, and seek to "create abstract forms" anew? These seem to be inconsistencies that discount professed sincerity.

I think "Positive" is doing himself and the school of thought he defends scant justice in complaining that we scoff at him, and I am sure the average thinking man of to-day is treating the matter very seriously, because there are very serious issues at stake. Many of us, believing that architecture has been developing in a fine healthy manner, fear a serious interruption to its sane progress by this insidious modernist influence. The strange and the new will always attract by their very strangeness and newness, and in the meantime we have to wait for the stragglers.

I commend this cure to "Positive." If he has really persuaded himself that modern architecture has arrived at a stage of stagnation, let him study the illustrations of files of old BUILDERS for the past thirty years, and ask himself honestly whether the work of the modern traditional school is still at the point where the 'nineties left it? The unfortunate thing is that these new cults have the nature of a drug, to dull the senses, and I fear that "Positive," having indulged to excess, will not become a convert until the poison has worked its way out of his system by natural process.

NEGATIVE.

[Correspondents are reminded that the last day for press is the Wednesday before each issue. Those who wish to take part in the discussion of a subject for debate are asked to do so on the fourth week of such subject, and the debates will derive added interest if they will do so then, rather than after a week or two, when a new subject has been opened. —ED.]

MEDIÆVAL LONDON*

The author takes up the story of London from A.D. 458, at which point he left it in his previous volume, "Roman London," carrying it onwards to the Tudor accession; and in this case he follows a like method of devoting half of the volume to a continued historical narrative and the second half to an attempt to recreate the social condition of the capital. "Attempt" is his own word, and we can say at once that the result comes as near to success as is practically possible. Little, if anything, exists in the nature of actual chronicles of London before the thirteenth century; but if we take London as a microcosm of Britain, it is quite possible to reconstruct her life in earlier centuries from such records as Bede's Ecclesiastical History and the Anglo-Saxon Chronicle. After the Conquest there is a much richer field to work in from the chronicles of Florence of Worcester, Henry of Huntingdon, William of Malmesbury, and other great scribes later on in the twelfth and thirteenth centuries, who made frequent allusions to London.

What is mediæval London—architecturally? To visitors from overseas, excepting, perhaps, those from the United States and our own Colonies, London must at first sight appear as a very modern city. London was always too prosperous to stand still, and she has made and re-made herself times out of number. The visitor's first 'bus ride, missing the Tower, might be from Aldgate Pump to the Marble Arch, and, but for a fleeting glance at the much-restored Guildhall and a full view of the old houses in High Holborn, he would see nothing to suggest that London ever was a mediæval city; and little enough would he discover of the dim past in an alternative route via the Strand. Old London is not to be seen at a glance along her main streams, but if we forage in her backwaters we shall find no less than eleven mediæval churches within the city walls and fifteen more which are extra-mural. These make a goodly show, but they are but a tithe of London's churches of the fifteenth century. FitzStephen, the biographer of Thomas à Becket, writes of 126 parish churches at a time when Peter of Blois, Archdeacon of Canterbury, estimated London's population at forty thousand—a place of worship, from a small chapel to a large church, for every three hundred souls, in addition to the Cathedral and thirteen monastic churches. London's last remaining mediæval palace, Crosby Hall, was removed to Chelsea in 1909, and is making history of another sort to-day.

It is good to turn to the two folding maps at the end of the volume—one a reproduction of a bird's-eye view of London and the suburbs about 1560, and the other a plan of London in the latter part of the Middle Ages, founded on a plan made by the late Mr. C. L. Kingsford; in the latter we get a fair idea of the very many churches and other principal buildings then existing and the few now remaining to us. Quite apart from the general interest of the main text of the book, the thirteen pages of chronology constitute a valuable addition to ar[illegible]al and historical studies.

*By GORDON HOME. (Ernest Benn Ltd.) 382 pp. 8vo, cloth. Price 18s. nett.

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THE SUBSTANCE OF ARCHITECTURE*

We have come to the conclusion that the foreword contributed to this book by Sir Edwin Lutyens is in no sense an exaggeration of its contents. Rather is it inadequate. It is not that architects need give no heed to what the critics say; it is that the author purifies the understanding of architecture both for the architect and the critic. It is true that the critic may be "flanked by all the powers of literary expression," but it is the architect who has too often shown that he was "backed by the hosts of archæology." Our dissertation upon the foreword is really the measure of our admiration of a book which gives a real meaning to the substance of architecture. When this meaning is clear to every architect, the warning note about the critic becomes unnecessary, and they can claim with the author a complete freedom from humbug in their outlook upon architecture.

This book quite definitely represents the spirit of the age in its time and place in the literature of architecture. In fact its appearance is overdue. The author recognises the spirit of the age in applying his philosophy of architecture to the outlook of the age. We are therefore prepared for an essay in common sense when he postulates the axiom—not merely a hypothesis—that architects are as necessary now, comparatively to the demands of the age, as Ictinus, Anthemius, Palladio and the brothers Adam were to theirs.

The philosophy running through the book is that architecture is both an occupation in which skill is directed towards the production of beauty, and is also one which is concerned with practical structure. "We [architects] *have* to fulfil certain material requirements, and we *desire* an appearance of beauty. The adjustment of those two is therefore our single occupation. It is the pith of the substance of architecture. Is it, then, an art? Yes, but under discipline. Is it an affair of common sense? Yes, but modified by a disposition to beauty by the fun of creating form." In this extract we have probably as sound a definition of architecture as any we have encountered, and in the minds of many readers it is certain to replace a number of half-truths amongst the accumulated philosophy on the subject. The student need not be in fear of absorbing a heretical conception of architecture; the author is careful to emphasise very strongly the quality of oneness of architecture. "But we architects only do one thing: we only arrange the lines of a building once in one way to achieve one object—good architecture. Ours is a single occupation."

It may, of course, come as a shock to some to read of a building that its beauty need have no relation to its utility. For those who may be sceptical we can submit the plea on behalf of the author that there is ample evidence to show that the converse is true—that utility need have no relation to beauty. It is evident we must free ourselves from humbug if we are to believe that, in art, any form of deceit is legitimate, so long as it increases the æsthetic value of the object. If we are in this frame of mind we can appreciate the author's difficulty in adhering to the motto of our grandfathers, "design in beauty; build in truth." Indeed, there is much on this subject in the book which will repay the careful student. Not many of us have realised that we have been prone to confuse the actual fitness of a building for its purpose—its real practical value—with the appearance of fitness or suitability in the significance of its architectural form. Nor have we realised the implication of the word significance to convey expressiveness or impressiveness. In chapter three the author submits a classified table dealing with the application of significance in architecture. Alone, it provides sufficient mental food to keep the most thoughtful architect busy. We find ourselves in complete agreement with the author in his opinion that the unbending insistence on efficiency at any cost in all our buildings to-day has created an accepted relation between the æsthetic and practical elements. It is the practical element which is stressed at the expense of the other much more severely than has ever been done before. Although we have dealt with this philosophy at some length, in fairness to the author we do not consider that he has over-stressed it. He carefully explains the separate influences exerted on the architectural form by the six material essentials—strength, durability, shelter, light, warmth, and salubrity. He has also some sound comment to offer upon the withering influence of the price of building.

Amongst a number of delightful things in this book we select the chapter upon styles of architecture. In a few pages the author gives us a finely written synopsis of architectural history and style. In refraining from quoting a number of extracts, which we suspect will some day be regarded as axioms, we choose one to conclude: "We aim at a perfect fulfilment of the material requirements within the stipulated price and, in giving it, we try to present an appearance of harmonious unity in the dominant aspect of the building and in its minor aspects too, both internal and external." Here is the perfect architect's creed.

This is altogether a book to buy and to treasure.

* By A. S. G. Butler, F.R.I.B.A. (London: Constable & Co. 12s. net.)

THE LONDON COUNTY COUNCIL SURVEY OF LONDON†

The scope and format of this invaluable series of official documents are so well known that the excellence of this, the eleventh volume, scarcely calls for eulogy. The preceding ten volumes, varying in prices from 10s. 6d. to 42s., dealt with Bromley-by-Bow, St. Giles-in-the-Fields, Hammersmith, St. Leonard-Shoreditch, St. Helen-Bishopsgate, and Chelsea Parish (Parts I to III). The present volume (XI) completes the survey of Chelsea, dealing almost exclusively with the buildings of the Royal Hospital. As a pictorial and historical monograph on that great historical foundation it has never been equalled, and it is scarcely likely that it will be surpassed. The joint editors, Messrs. Montague H. Cox (for the Council) and Philip Norman (for the Survey Committee) are to be congratulated on their share in this great Survey, which, in a restricted sense, is doing for the County Council area what the Royal Commission on Historical Monuments is doing for the kingdom as a whole.

Chelsea is a salubrious spot; it is by the inhabitants considered a privilege to live there. Its salubrity in days gone by can be proved by a perusal of the inscriptions on the old tombstones in the little churchyard attached to the Royal Hospital; long life was the rule rather than the exception.

If Cheyne-walk and Cheyne-row, with their literary and artistic associations, are mentioned the more often, the Royal Hospital is Chelsea's greatest monument and chief glory. It ranks amongst Wren's masterpieces not only architecturally as a happy combination in brick and stone, but as a logical design in hospital architecture embodying the salient features of the fifteenth-century semi-monastic foundations scattered over the realm for the shelter of war-worn warriors. Wren realised the historical significance of the common qualities he found in the mediæval foundations, however much they varied in actual details, and having nothing to contend with in site difficulties, his imagination was allowed full play, and the building, which stands to-day practically as he left it but (happily) in wider surroundings, is a lasting testimony to his poetical genius.

To quote the book: "The Royal Hospital at Chelsea does not indeed possess the lofty dome of the *Hôpital des Invalides* at Paris, nor the twin domes of Greenwich Hospital, but it gains a rare quality of peaceful domestic architecture by the absence of these ambitious features." The site, as in the case of Greenwich Hospital, is a noble one overlooking the Silent Highway, but with just that subtle difference that whilst the sailor pensioner has, to his infinite delight, an everlasting panorama of the world's shipping at its busiest, the red-coated Chelsea pensioner gets but a distant view of a placid and almost deserted reach of the tidal-way that leads to The Pool, whence men go down to the sea in ships. The sea voyage was but a mere incident in the soldier's career.

The book affords a feast for a variety of readers. The archæologist will find all he wants in actual views, elevations and plans; the historian in carefully collated data concerning the foundation; and the antiquarian-connoisseur in a wealth of pictorial details of fitments and furnishing. The modern "Old Mortality" will find much to interest him in the appendices dealing with the Moravian, the King's Road, and the Royal Hospital burying grounds. Needless to say, the illustrations, as usual in the Survey volumes, are quite perfect.

† *Vol. XI. Chelsea (Part IV).* Published for the L.C.C. by B. T. Batsford, Ltd. 130 pp., 102 plates; royal quarto, paper covers, 42s. net.

ARCHITECTURE‡

Readers possessed of little or no technical knowledge, for whom Mr. Russell's book on "Architecture" is intended, will find it pleasant and absorbing reading. Even such a matter as the construction of the Gothic vault is reduced to terms that are by no means formidable; similarly, at a later stage in the book, there is a brief but lucid explanation of reinforced concrete, and elsewhere simple guidance to comprehension is supplied where technicalities are inevitably touched upon. The variety of information and interrelated facts contained in the compass of the book is astonishing; yet there is seldom a sentence, however seemingly irrelevant, that does not contribute some thought or fact to illuminate the edifice of architectural history examined from its rise in the Mesopotamia of 5000 B.C. to its present condition in America and Northern Europe. While the main portion of the volume is naturally concerned with the historical development of architecture, it is by no means limited to historic styles; nor is there undue bias towards the antique. "The Modern Position in England" occupies two chapters, one devoted to houses and the other to buildings in general, in which some of the problems of to-day are discussed. The author launches a useful caution against what he calls the "period" snare: "the temptation to produce eighteenth-century designs for twentieth-century houses," and against the "'Old-World' ideal pursued by people who take a strange pleasure in making a sitting-room look like a farmhouse kitchen . . . hung about with . . . miscellaneous pieces of obsolete household gear."

Consideration of the responsibility of lay opinion in relation to the architecture of the future induces the author to state the case for the younger architects in the following terms: "What of the future? Perhaps the most important fact to notice is that there are now architectural schools all over England sending out every year a stream of young men highly trained in design and keenly alive to the latest developments in foreign countries. Whatever may be the character of the work these young men will produce . . . it will not be dull . . . we must be prepared to dislike a good many of the buildings produced in the experimental stages, and, in spite of that, to applaud them and to encourage their designers. In architecture, as in everything else, pioneers need courage and patience." "But," he adds, "we are more likely to discover some guiding principles among the records of the past than anywhere else."

‡ By A. L. N. Russell. The Simple Guide Series. (London: Chatto & Windus.)

THE BUILDING EXHIBITION

We announced in our last issue (in which a plan and a complete list of exhibitors were given) the arrangements made for the opening of the Building Exhibition, which took place at Olympia to-day (Friday). Below we give detailed notices of some of the principal exhibits. A full account of the opening of the Exhibition, together with further notices on exhibits, will be given next week.

A.C.E. Machinery, Ltd. (Porden-road, S.W.2). **Stand No. 7, Row B.**

Contractor's Plant.—Here is shown a complete range of builders' and contractors' plant, including "A.C.E." friction hoists complete with double flat drive winch, guide rails, platform, tipping skip. Also the "Tonkin" mixer of the open drum type for mixing all kinds of materials, exceptionally efficient in mixing light aggregates, sand and cement, clinker, ashes, compo, etc. It is made in sizes from 4 to 14 cu. ft., with or without power. Besides a variety of other mixers is shown the "Australia" block, slab and brick-making machine, made in sizes to suit customers' requirements. This and a variety of moulds in aluminium and cast-iron for making garden ornaments, complete a comprehensive exhibit.

The Adamite Company, Ltd. (Regent House, Regent-street, W.1). **Stand 136, Row G.**

White Portland Cement.—The "Atlas White" Portland cement exhibit is largely devoted to striking examples of colour in concrete. All departments of white concrete production are represented. True Portland cement stucco in varying shades and textural finishes; white cast concrete stone in its best form; an attractive collection of marble terrazzo slabs, pre-cast, pressed, and of the laid *in-situ* type; brass and other varieties of terrazzo dividers; modern examples of shuttered surfacing (*a*) to obtain attractive appearance and (*b*) to obtain a perfect bonding surface; illustrations of pointing and setting marble and delicately-coloured natural stone in white, cream and red-brown true Portland cement mortar; the beautiful colouring obtainable by exposing crushed Venetian glass aggregate in a score of shades; aggregates of sand, stone, spar, mosaic and glass from almost every quarter of the British Empire—all will be found on the "Atlas White" stand. The dominating feature of the exhibit is an exact replica of the huge base of one of the columns which form part of the general design of the front elevation of the great Carreras factory in Mornington-crescent, Camden Town. The Egyptian design and beautiful colouring of this column will be noticed at the Exhibition. A portion of a design for the Rail in front of a Buddhist Temple (Mr. Ernest Bates, F.R.I.B.A., architect) reproduced in "Atlas White" sand-cast concrete stone, an exposed aggregate of snow-white crushed granite supplying the colour content of the tooled surface, occupies a prominent position on the stand. In addition to these examples of white concrete, several uses of "Colemanoid," the well-known concrete water-proofer, oil-proofer and floor hardener, are shown. Taken all round, this is an exhibit which no architect or contractor can afford to miss. Interesting in itself, it is likely to provide much food for thought to the practical man.

Robert Adams (St. Ann's-Chambers, 1/2, Orchard-Street, Westminster, S.W.1, and 3/5, Emerald-Street, Holborn, W.C.1). **Stand No. 54, Row D.**

Interior Building Fittings.—The exhibit includes a comprehensive display of "Victor" specialities, including new patent improved types of door-spring hinges. The exceptional opening capacity of certain types should be noted. They are well suited for public buildings, hospitals and stores, business premises, and offices. The "Victor" door springs are designed to allow the door to be opened easily and to hold it firmly at the closed position. The closing speed of the door can be regulated as desired. Other exhibits include: Overhead door springs of the fluid check-action and the pneumatic patterns; door accessories of all kinds, including door buffers, door stops, etc.; numerous types of "Victor" window gearing, etc.; the "Victor" universal system of reversible window fittings for double-hung sashes; "Pullman" sash balances; "Victor X-it" panic bolts for business premises, hospitals, theatres, etc.; mounted sections of various types of weather bars suitable for all kinds of casements and sashes; sliding door and partition fittings, casement bolts, casement fittings, including stays, fasteners, etc., and a wide range of locks and furniture, etc.; fittings suitable for housing schemes. The firm are agents for Great Britain for Maison Picard, of Paris, who make decorative, period, and other brass-foundry of all kinds.

D. Anderson and Son, Ltd. (Park-road Works, Stretford, Manchester). **Stand No. 110, Row F.**

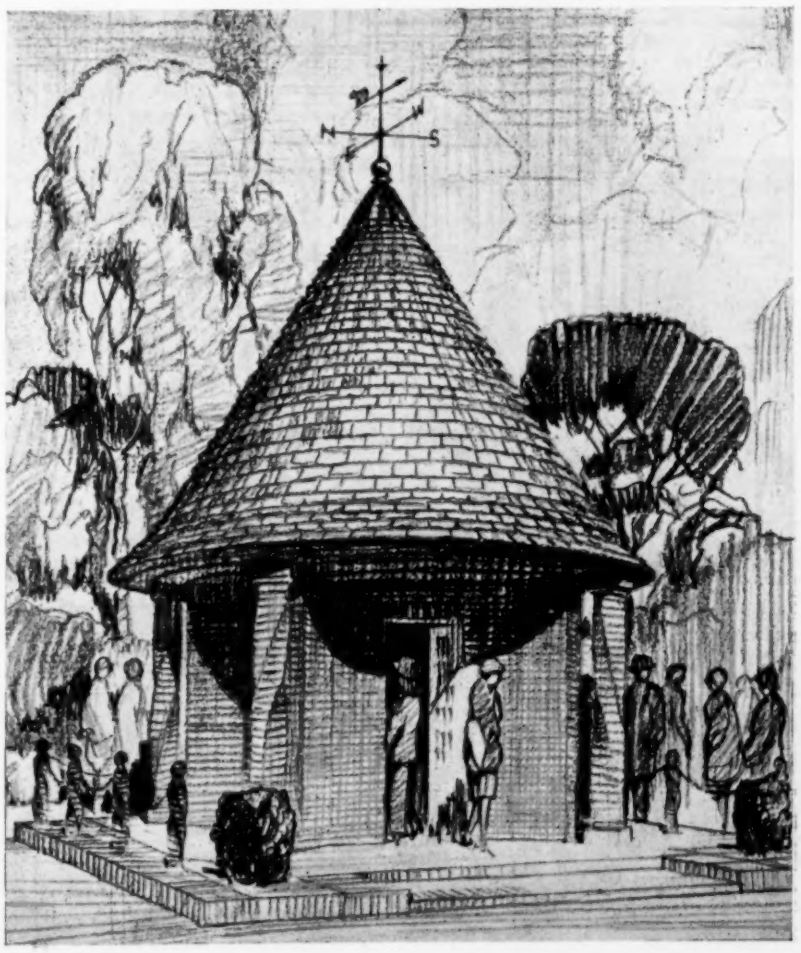
Roofing Felts and Dampcourses.—As usual, the stand of this firm contains a comprehensive selection of roofing felts in various grades for different purposes. Different types of the firm's dampcourses are also shown, and their applications demonstrated. "Sidol" wood preservative is made in two grades, one for outside use and one for interior decoration; both these are shown on parts of the stand, so that the effect may be judged by the visitor. Other exhibits include models of a Belfast roof, felt for lining under slates, and a large model demonstrating all the uses of "Red Hand" roofings.

H. Arnault, Ltd. (Avenue Chambers, 4, Vernon-place, W.C.1). **Stand No. 82, Row E.**

Flooring Tiles.—This stand gives a special display of modern features in high-class flooring tiles of vitrified sandstone, either in the usual square patterns or octagonal, with special new enamelled flooring tiles, which combined with ordinary flooring tiles give a more decorative effect, and a new relief to the floor. Several combinations and designs are being fixed on the floor of the stand. Special attention is to be given to the new curved edged flooring "Josefern" tiles, which are a great novelty in this country, this type of tile giving very attractive designs, somewhat different from what has been done up to now with mosaic tiles or with terrazzo. This stand displays several combinations and designs of the most decorative effects. To be noticed particularly are some Venetian tiles, while another feature of this stand is the beautiful panels made of engraved glass. Special display is given to new scientific diffusers and flood-lights, which are likely to prove very interesting for shop lighting, showcase lighting and generally all places where a good light is required. Several patterns of flood-lights special for dog racing and dirt racing tracks are also presented to visitors.

Athena Composition Flooring Co. (Athena House, Hogarth-Lane, Duke's-Avenue, Chiswick, W.4). **Stand No. 114, Row F.**

Jointless Flooring.—This firm now does a large business in the specialist work of laying jointless composition flooring of the type that has become so popular not only for offices but also for housing schemes, and, as may be seen from the specimen sections laid on the stand, it is not out of place on the floors of the best type of house. "Athena" flooring is resilient, warm, and comfortable, and is sup-



A Woodland Shelter. (Stand of Messrs. W. T. Lamb & Sons.)
Sir Aston Webb & Son, Architects. (*See page* 641.)

plied in a variety of pleasing shades and designs. The covering may be used on any type of flooring, whether cement, wood, or metal; it may, in fact, be applied on any hard surface. The stand also demonstrates sections of the attractive wood-block and parquet floors in which the firm specialises.

Bath Artcraft, Ltd. (Lower Bristol-road, Bath). **Stand No. 33-40, Gallery.**

Leadwork.—This firm is exhibiting some interesting examples of leadwork. For the constructional work, they have adopted the modern method of jointing with the gas jet, and from this process have evolved the general decorative treatment of the work. In making a rain water pipe, for instance, instead of hiding the joint at the back of the pipe as is the general custom, they have placed the burnt joint on the front between two strengthening fillets, and this actual constructional work is used decoratively. All sorts of very interesting and beautiful patterns are formed in the burning.

The rain water cistern shown here is made up of cast sheet lead. The relief work of the border and the animals in the squares are pressed into the sand bed from small models, before the lead is run over the table. The alternating squares are enamelled, freehand, with the gas jet in tin and antimony, on a cast lead surface, and the lines dividing the chequers and around the inside of the border are of lead burnt on with the gas jet in the manner described above. Altogether a most interesting and attractive stand.

B. T. Batsford, Ltd. (94, High Holborn, London, W.C.1). **Stand No. 65, Row D.**

On this stand is a selection of books on architecture, building, and all the allied professions and trades. Messrs. Batsford claim to hold the most comprehensive stock in the country of books on these subjects, and the stand should be visited by all interested in this type of literature. A selection of old and rare books is of particular interest.

Bellman, Ivy and Carter, Ltd. (Linhope-street, London, N.W.1). **Stands Nos. 77 and 78, Row D.**

Wall Decoration.—Scagliola, the old Italian wall decoration, is said to have been introduced into this country about 1750 by James Wyatt, and for the past 125 years it has been manufactured in this country by Messrs. Bellman, Ivy and Carter, among whose important recent contracts are the columns and piers in the new Manchester Royal Exchange, which were made to match the marble in the old Hall. There are about 150 different varieties of scagliola to be seen on the stand. Other exhibits include fibrous plaster work.

Bell's Poilite and Everite Co., Ltd. (Asbestos House, Southwark-street, S.E.1). **Stand No. 258, Row Q.**

Asbestos Sheets.—This tasteful stand is of great interest, as it features a new decorative product, "Decorated Poilite." The octagonal stand—divided into four main divisions—shows in each a separate interior treatment with the material. The bathroom—tiled with Bell's asbestos rigid rubber floor tiles—illustrates the application of type B decorated sheet. The entrance hall interior is a good example of Bell's "Decorated Poilite" for walling, and this time for the floor also; and the other two interiors show yet different schemes for the lining and panelling out of a shop window and a bar. The remainder of the floor space is utilised for displaying the wide range of "Poilite" and "Everite" asbestos-cement products for roofing and many other purposes, and the visitor is able to handle and investigate as much as he wishes the actual full-sized samples of these products. The exhibit is surmounted with a roof, the different portions of which show Bell's Poilite and Everite roofing products in actual application.

Blundell, Spence and Co., Ltd. (9, Upper Thames-street, E.C.4). **Stand No. 262, Row Q.**

Paints, etc.—This stand is painted with Messrs. Blundell, Spence's various decorators' specialities. There is also on view an interesting collection of gums and raw materials used in the paint industry which constitute an interesting exhibit. A technical expert is in attendance for the convenience of callers requiring advice or information regarding paints and decorative materials. The following decorative materials are given special prominence:—"Pammel" (Blundell's petrifying liquid enamel). This is a bright-drying finish for wall surfaces, wood, and metal work, which dries with an intensely hard surface resembling glazed tiles, while Blundell's "Transparent Petrifying Liquid" will be found useful for the prevention of damp walls, treatment of new plaster, and preservation of stone, brick, etc., from decay. Blundell's "St. Paul's" liquid paint, glossy "Japonette," flat "Japonette"—an artistic and really washable flat oil paint for walls, ceilings, and woodwork—"Hard Gloss" paint, and a variety of varnishes complete a fine exhibit.

British Fibrocement Works, Ltd. (Head Office and Works: Erith, Kent). **Stand No. 133, Row G.**

Asbestos Cement Goods.—This stand has been specially designed as a pavilion to illustrate the various "Fibrent" asbestos-cement manufactures. On the various slopes of the roof will be found illustrated "Fibrent" slating in diagonal, honeycomb, and straight styles, and in the many colours obtainable. On the larger slopes are shown "Fibrent" standard corrugated, and "Fibro-Super" corrugated sheeting. "Fibro-Super" corrugated sheeting has 6-in. corrugations and is of exceptional strength, and both types can also be supplied curved to any radius, and in colours. The external treatment shows the use alternatively of "Fibrent" corrugated and flat sheets. Scalloped slates, and tile hanging and weather sheeting are also shown. The interior shows the use of flat sheeting for ceilings and walls, and the many decorative and panelled finishings which may be satisfactorily employed. "Fibrent" rebated panel sheeting, with timber grain and special sheets for bathroom walls, etc., are also displayed.

William Briggs and Sons, Ltd. (5, Cowgate, Dundee). **Stand No. 33, Row C.**

Roofing and Dampcourses.—This well-known firm, who specialise in bituminous building materials have a comprehensive display of felts and dampcourses. "Challenge" felt is specially made for permanent roofs of all descriptions, and has been largely used for factory buildings. Other roofing felts on view include "Bituflex," for semi-permanent roofs, and "Utex" for sheds, garages, outhouses, and other small structures. There are three different grades at different prices for every type of roof. The company has concentrated on the perfection of three types of dampcourse, known as "Aqualite," "Plastique," and "Challenge": each of these is shown, and its use demonstrated in a practical manner that will appeal to the builder. "Tenax," "Viaduct," and "Briggool" bituminous solutions and anti-corrosive compositions are also exhibited by practical demonstration.

Bryce, White and Co., Ltd. (Deseronto Wharf and Mills, 28, Wharf-road, City-road, London). **Stand No. 141, Row H.**

Joinery, etc.—An excellent display of joinery, turnery, etc., is here shown. "Castle Brand" doors are made of thoroughly well-seasoned Swedish redwood, mortised, tenoned and wedged. They are available in a wide range of patterns for both interior and exterior use in all the standard sizes. "Red Cone Brand," Western pine doors are of wood specially selected for the beauty of its grain and freedom from knots and defects. The rails and stiles are solid with panels of rotary-cut figured plywood. The doors are widely used where stained or polished doors are required. Stocks are held of distinctive patterns in many sizes. The firm hold a comprehensive stock of mouldings (including many attractive suites). "Brycite" mouldings are manufactured from White Sea and first-class Swedish timber, but can be supplied in hardwoods where desired. Special designs can be worked in the mills at short notice. The firm also keep good stocks of garage doors and gates, kitchen dressers, chimney pieces,

Specimen of Leadwork: A Water-tank.

turnery, trellis, prepared and sawn timber, flooring, matchings and joinery of every description.

"The Builder," Ltd. (Head Office: 4, Catherine-street, Aldwych, London, W.C.2). **Stand No. 116, Row F, and Stand No. 231, Row N.**

"The Builder," "Architecture," and other Publications.—This large stand forms a comprehensive library for the use of visitors interested in the literature of architecture, building, surveying, and the allied arts, crafts, and trades, all the publications shown being on sale. Here are to be seen copies of *The Builder*, as well as *Architecture*, the bi-monthly magazine for the profession. Note should be made by architects of some of the special numbers of this journal, copies of which are still available; these include "Shop "Fronts," "Schools," and "Domestic Architecture" numbers—valuable works of reference on modern design on these subjects, obtainable at the low price of 1s. The books shown cover every branch of architecture and building—all are thoroughly practical works by specialist authors, and all are published at popular prices. Everyone interested in London's history should acquire a copy of Mr. Herbert Cox's "Old London Illustrated," which not only gives a concise account of the development of the world's largest city but contains a large number of drawings of the old buildings and streets of the City by the late H. W. Brewer. In addition to the publications there are models of interesting structures of old London which have now disappeared, and which one can visualise from these models. Other models are of houses with three and four bedrooms, which were awarded first prizes in *The Builder* Competition. At Stand No. 231, talks on Old London will be given in a special room set apart for the purpose; these talks are by authorities on the subject, and visitors are cordially invited to call in and hear them.

Of special interest is the new model of the Keep of the Tower of London. Some points of interest are referred to in our Notes column, but all interested in mediæval methods of building construction should make a point of visiting the model. It has no south wall, that the interior may be inspected. The Norman entrance was on this side, which existed until the late thirteenth century. A drawing of 1597 shows the Keep with a single-span roof, while the basement floors were of natural earth, as in the sub-crypt at present. The upper floors must have been spanned by beams, except those of the Crypt and St. John's Chapel, which have floors of masonry. This chapel is the oldest and most perfectly preserved Norman church in England. It has timber pillars, with five varieties of capitals, some with the early T-shaped figure. Only seven pillars appear in the model, but all varieties are reproduced.

A. A. Byrd and Co. (11, Queen Victoria-street, E.C.4). **Stand No. 314, Row V.**

Steel Shuttering.—Samples of the well-known "Metaform" steel shuttering for *in situ* concrete construction are shown, illustrating the various formations obtainable with these forms, such as retaining walls, large circular tanks, floor and beam construction. An actual section of an ornamental dwarf sea wall as erected by a well-known council, is reproduced, showing how the sunk panels and various decorative curves, etc., are obtained with the standard "Metaforms." Samples of the "Metaform" road rail and curb and gutter forms are exhibited, as used in modern concrete road construction. The whole of the exhibits are displayed to represent an actual concrete job proceding, with a scenic effect on the back screen to help the illusion. New models of the "Kwik-Mix" tilting drum concrete mixers are displayed, with several features new to this class of mixer. Practical demonstrations will also be given with a new medium, "Tricosal S 111," which is used with ordinary Portland cement to repair leaks in concrete walls, tanks, manholes, floors, etc. New models of the latest types of electrical woodworking machines, specially suitable for the building trade, complete a valuable exhibit

George M. Callender and Co., Ltd. (25, Victoria-street, S.W.1).—**Stand No. 62, Row D.**

Bituminous Materials.—On this stand are displayed a large number of roofing materials, dampcourses, and other bituminous materials for which this firm is so well known. A feature of the exhibit is a number of practical demonstrations proving the impermeable properties of the sheeting and dampcourses when subjected to tests of a very severe nature. The roofing felts, linings, and dampcourses are supplied in rolls up to 36 ft. long by all the usual widths. The ever-increasing public concern in road schemes is concentrating attention on the "Reavilia" expansion joint here shown; this is an elastic joint, for insertion between the joints of concrete slabs, with the object of preventing contraction and expansion cracks by providing an elastic joint at suitable intervals.

Candy and Co., Ltd. (Heathfield Station, Newton Abbott, Devon; 60, Berners-street, Oxford-street, W.). **Stand No. 184, Row K.**

Fireplaces.—Here are displayed "Devon" fireplaces in designs suitable for any style of room, made in artistic designs and colourings with bright or dull glazed mottled antiques. The "Devon" fire is made in various types—the "sunk" or open barless type, flat bottom or front bar type, and the "raised" type. These fires embody the correct principles of construction. The back and sides are composed of specially prepared fireclay, which, being a bad conductor, retains the heat and acts as an added source of radiation. Schemes for interior wall tiling in a variety of glazing effects are suggested by means of a display of various styles of goods, while vitreous flooring tiles in buff and red, including Candy's "White City" pattern embossed paviors, are also on exhibit.

Walter Carson and Sons (Grove Works, Battersea, London, S.W.11). **Stand No. 190, Row K.**

Decorating Materials.—This stand has a fine display of pure liquid paints for high-class exterior and interior decoration. Among them are :—"Vitrolite," the greenhouse paint, and for exterior and interior work; "Muraline," the washable water paint; "Muraprime," the priming for distempers; "Japolite," the super white enamel; "Coverine," a splendid white undercoating; "La Belle Enamel," a brilliant and glossy enamel, which may be obtained in 32 shades; a variety of metallic paints for radiators, etc.; enamels, aluminium paint, for ironwork, water and steam pipes, etc., and many others.

Cayless Bros. (Battersea Park-road, S.W.8). **Stand No. 154, Row H, and Stand No. 198, Row K.**

Builders' Equipment.—The progressive builder and contractor is always alert for ways and means of increasing the efficiency of his business, and there are many appliances on the market that he should make a point of seeing from time to time in order to keep up to date with current developments and to see that worn-out apparatus is replaced with the best that the market has to offer. In such accessories as builders' ladders, barrows, painters' steps, hand-carts, trestles, trucks and building plant generally improvements are being constantly made. Messrs. Cayless Bros. exhibit a comprehensive array of such accessories, which are well worth close inspection.

Caxton Floors, Ltd. (39, Victoria-street, Westminster, S.W.1). **Stand No. 257, Row Q.**

Floors.—"Caxton" floors are constructed solely by the patentee. Effective insulation of heat and noise is one of their most predominant features. Another is their immunity from cracking. The prevention of undue deflection is a problem that always receives attention by floor designers, and Messrs. Caxton Floors, Ltd., have given it special consideration. "Caxton" floors are laid *in situ*, thus effectively knitting together the entire fabric of a building. Their principal feature is parallel rows of hollow burnt clay tiles with reinforced concrete ribs in between; specially designed not only to eliminate useless materials, but, still more important, to place the steel and concrete in scientifically correct positions where they function fully. The stand—a most helpful one to the architect—is a miniature modern concrete building, rough cast on the exterior and the interior panelled in mahogany faced plywood. The ceiling is constructed in receding planes with hidden lighting. Scale models are on view of the "Caxton" floor, showing every detail of their construction. Experts in floor construction are in attendance and are at the service of visitors to the Exhibition.

Cement Marketing Co., Ltd. (Portland House, Tothill-street, Westminster). **Stand No. 109, Row F.**

Cement, etc.—On this stand there is an excellent display of the following products which are marketed by this organisation :—"Blue Circle," the cement which is in great demand for ordinary concrete work; "Ferrocrete," the rapid-hardening Portland cement; "Lightning" brand aluminous cement; "Hydralime," the most modern form of hydrated lime for plastering and mortar; also lump limes and whiting. To show the variety of purposes for which concrete is used in the building trade to-day, exhibits of concrete bricks, tiles, a window-frame and fireplace, etc., are on view.

Charles Churchill and Co., Ltd. (9-15, Leonard-street, E.C.2). **Stand No. 298, Row T.**

Building Products and Tools.—A number of useful adjuncts to building construction and equipment are shown by this firm, including the "Alundum" slip-proof products, which include a range of floor and stair nozing tiles, mosaics and aggregates in various colours. Also exhibited are the Manning abrasive cloths and papers, which include :—waterproof garnet paper for wet rubbing down of enamels, varnishes, etc.; waterproof flint for wet rubbing of paint; garnet paper for dry sanding woodwork, and metalite cloth for polishing metal. The remainder of the exhibit is devoted to various tools for builders, joiners, etc., comprising hammers, saws, planes, squares, levels, trowels, etc., by leading well-known manufacturers.

Coalbrookdale Co., Ltd. (1, Berners-street, W.1.). **Stand No. 210. Row L.**

Stoves and Tiles.—Display is made here of the well-known "Servall" (Minor No. 4) Stove—convertible from a cooking stove to a sitting-room grate, and of interest to architects carrying out housing schemes or small houses, where a combined kitchen and living-room is necessary. Another style of this same pattern is the "Servall" (Major No. 5), of use for larger houses. A stove which is of a type suitable for living-rooms, and which will also heat a cylinder or radiators is the "Warmall," there is a pleasant display of roofing tiles, the "Waterib" pattern, "Lightmoor" brand of genuine Broseley type. Architects and builders will visit this stand with advantage.

Cochran and Co., Annan, Ltd. (Annan, Scotland). **Stand No. 38, Row C.**

Water Heaters.—There are as many as 22 standard sizes of "Cochran" boiler, ranging from a diameter of 2 ft. 6 in. by a height of 5 ft. 6 in., to a diameter of 8 ft. 6 in. by a height of 17 ft. The two principal features of this boiler are the elimination of steam space, and the introduction of a "banking" firehole above the level of the normal firehole.

Cookers and Geysers, Ltd. (244, High Holborn, W.C.) **Stand No. 252a, Row P.**

Cookers and Geysers.—Here is shown an interesting display of apparatus. The "Ascot" automatic geyser is pressure-proof, and can be connected directly to the main. The heating

chamber is so constructed that no condensation takes place, and consequently the geyser will last for a very long time. The "W" type "Ascot" geysers are of similar construction, but will only supply the bath. The L 24 type, for the standard bath, is fitted with interlocking taps, and can be supplied with fixed or flexible shower. The K-E type is a coal-fired water heater of great efficiency, fitted with a spray. Many different models of domestic gas cookers are shown. The "Aristo" cookers are white porcelain enamelled on the outside, and all mountings are nickel-plated. Model No. 200 is an oven enamelled inside, and fitted with single burner, and bottom flue outlet. On the hot plate there are three boiling burners and a fourth combined boiling and grilling burner controlled by two taps. Also exhibited are several models of cookers fitted with grilling oven in addition to the baking oven, specially designed for high-class cooking, and French cuisine. The oven control tap is fitted with a safety lock, which prevents its being opened by accident. The firm also specialise in kitchen equipment for hotels, restaurants, etc.

[For Cowan, Hulbert, Ltd., see page 639.]

Croggon and Co., Ltd. (16 and 230, Upper Thames-street, E.C.4). **Stand No. 43, Row C.**

Building Equipment.—This stand is a practical example of constructional steelwork and is supplemented by photographs of contracts carried out by the firm, consisting of garages, factories, cinema studios, hay sheds, etc., etc. On the stand will be found a range of builders' goods, such as: "Toro-Fen" wire field fencing, "Gloriden" garden fencing, steel fencing standards, wrot-iron fencing, tennis-court surrounds. The tanks, cisterns and cylinders shown are a selection from standard sizes, but special sizes can be made up to customers' requirements in a few days. The "Ceeco" and "Vulcan" rubber roofing felts answer the builders' demands for a reliable felt at a cheap price. Ventilators, steel barrows, builders' buckets and corrugated sheets help to show the services which this old-established firm can render to builders.

Davies Bros. (Timber and Joinery), Ltd. (225, Lea Bridge-road, Leyton, E.10). **Stand No. 58, Row D.**

Joinery.—Here is to be seen a particularly comprehensive range of joinery for small houses, well-made of good materials, but inexpensive. The stand, in fact, contains a selection of goods of special appeal to the speculative builder. The display includes window and door frames, external and internal doors, stairs and staircase fittings, English and imported mouldings, dressers, gates and similar articles of joinery.

The Davis Gas Stove Co., Ltd. (60/2, Oxford-street, W.1). **Stand No. 312, Row Y.**

Gas Cookers.—Here are exhibited several types of gas cookers and fires that will well repay a visit from architects and contractors. Among them are "Nautilus" welded mild steel "Interdependent" domestic boiler and gas cooker; "Nautilus" cast concrete "Economy" flue block construction for use with gas fires, and "Armoured" gas grates and surrounds and gas mantel registers. Kitchen cooking and water-heating combinations, a display of geysers and a variety of wood mantels and tiling complete an interesting show.

Diamond Tread Co., Ltd. (28, Victoria-street, S.W.1). **Stand No. 278a, Row S.**

Non-slip Treads and Tiles.—The tiles and treads shown on this stand are composed of sparkling grit and a special cement of great hardness. Combined with ordinary tiling and mosaic, it makes a very beautiful flooring, with the added advantage of a sure foothold. It is especially useful, we learn, for hotels, public stairways, etc. Various kinds of section treads in aluminium or brass framing, filled with patent non-slipping materials, and suitable for hotels, shops and restaurants, are shown into the bargain. No architect should miss this stand.

Doulton and Co., Ltd. (Lambeth, S.E.1). **Stand No. 149, Row H.**

Sanitary Fittings.—A comprehensive selection of various types of sanitary fittings is here shown, comprising two model bathrooms, one including Timos Simili marble lavatory, and the enclosed "Delphian" bath with plinths made of the same material, and the other containing all necessary fittings of a cheaper type suitable for a small house. Porcelain enamelled cast-iron baths of various kinds and sizes are shown, including "Allan" baths, designed for building into a wall. In addition there is a varied selection of earthenware lavatory basins, of both the pedestal and wall types, with taps in the centre or at the side, as well as strong fireclay basins suitable for office or factory. A feature of special interest is the new coloured earthenware basins, which, with their delicate tints and varying shades of colour, open up with possibilities from a decorating point of view. Water closets of various patterns are included in both earthenware and fireclay, and for the overhead cistern or low compact types. There is also a generous display of sinks, glazed stoneware pipes and fittings for sewerage and drainage, terra-cotta chimney tops, air bricks and ridge tiles, glazed ware decorative materials, fireplaces, etc. An interesting feature of the stand is a model of the company's new pipe works at Erith, near London.

Drew, Clark and Co. (Diamond Patent Ladder Works, Leyton, E.). **Stands No. 187, Row K, and 57, Gallery.**

Telescopic Laddering.—Drew's patent telescopic ladders, in two, three and four sections, and from 9 ft. to 90 ft., aid in a display which is of the greatest interest to the keen contractor and decorator. Drew's patent decorators' ladders, platform steps, scaffold trestles and tower ladders are also in profuse display, as are Higgs' and Drew's patent "Rap-Rig" sectional scaffolds, the well-known scaffold for interior decoration of churches, institutions, clubs, hospitals, theatres, cinemas, public buildings, and business houses. This scaffolding represents a saving of time and consequently a saving and a gain in money, and as such will interest all who use scaffolding.

The Dry Rot and Fire Prevention Co., Ltd. (30, King's-road, St. Pancras, N.W.1). **Stand No. 166, Row J.**

Dry Rot Prevention.—This exhibit presents a British preparation, "Toritna," by which wood may be rendered proof against dry rot. Wood treated with it can be finished in any manner required. It can be painted, varnished, wax- or French-polished, or used as an ordinary wood stain, an almost unlimited range of colours being available. The solution is also supplied fireproofed. It is claimed to be odourless, non-toxic and permanent, and easily applied.

Educational Supply Association, Ltd. (Esavian House, 171-181, High Holborn, W.C.1). **Stand No. 303, Row T.**

Overhead Doors.—"Esavian" overhead doors are featured on this stand. Patented and manufactured in England, they represent something entirely new in garage doors. They are composed of leaves arranged horizontally instead of vertically, as is usual with ordinary garage doors; each leaf is about 2 ft. deep, the length being in accordance with the width to be covered. At the ends of the leaves are fixed special fittings with ball-bearings. These fit in a specially stamped steel track which extends the full height of the door and is then curved backwards and extends under the roof or ceiling a sufficient distance for the door to rest on in a horizontal position when raised. A full-size working example of this door will interest all builders and contractors visiting this stand.

Electrolux, Ltd. (153-5, Regent-street, W.1). **Stand No. 77, Gallery.**

Cleaners, Refrigerators, etc.—The Electrolux Cleaner has a high suction efficiency, is portable and makes a minimum call for physical effort. Some of its advantages are as follows: there are no screws to adjust; the dustbag is totally enclosed; dust and dirt cannot come near the motor or fan; the suction will pick up solid bodies without affecting the machinery and the user has no weight to carry. The Electrolux Refrigerator, a simple and efficient cold storage fitting, is without a single mechanical moving part to call for attention and is entirely without noise or vibration. Once installed with an attachment to the gas or electric main and the water supply it will continue to function indefinitely without adjustment and at a trifling cost per day. The new Electrolux Water Softener is a method of employing the well-known base-exchange method of softening water for domestic purposes. It can be fitted in a moment to any water tap in the house. The Electrolux Floor Polisher, owing to the carefully designed brush action, leaves no brush marks on the waxed surface of a floor. The brushes are quickly interchangeable and special rubber buffers obviate all possibilities of damage to furniture, walls, etc.

Samuel Elliott and Sons (Reading), Ltd. Stand No. 137, Row J.

Architectural Woodwork.—The exterior of this stand shows a half timber structure in English oak, adjoining another pavilion having a rather modern treatment. The outside of this part of the stand (which is in British Columbia pine with African mahogany columns with black inlays) forms a contrast to the adjoining half-timber work. The interior of the stand consists of a panelled room with ingle seats and stone fireplace, and also an oak staircase, with twisted balusters and handrail and newel treatment to suit. The ceiling beams are of great age, and the floor is of elm boards. The whole interior makes a charming little hall. The adjoining room is panelled in yellow pine, finished an old mellow tone of an early Georgian character, the floor being of straight jointed oak. The firm also manufacture panelling in all periods, church-work, bank fittings, revolving doors, staircases, parquet flooring, screens, etc. The stand includes sundry exhibits of all kinds of panelling, parquetry, mouldings, turnery, veneered work, doors, including the following specialities:—Elliott's patent interlocking rail panelling; hospital door; water bar for casements opening inwards; and anti-cyclone revolving doors.

Elsan Manufacturing Co. (34-35, High Holborn, W.C.1). **Stand No. 300, Row T.**

Rural Sewerage Systems.—Here is an exhibit of outstanding interesting to everyone interested in building in rural or unsewered parts. The "Elsan" chemical indoor closet is guaranteed absolutely odourless, hygienic and germproof, yet it requires no sewers or water flush. We learn that it brings to country homes and buildings all the refinements and comforts of indoor sanitation. The "Elsan" system is installed by the London County Council, the Corporation of Manchester, Wolverhampton, Plymouth, etc., and by over 200 health authorities in various councils in Great Britain. Three different models of the "Elsan" chemical closet are exhibited, each of which is highly recommended for the particular type of property for which it has been evolved. The "Elsan" portable model de luxe, the "Elsan Junior," and for institutes, schools, factories, clubhouses and similar buildings where the needs of a large number have to be provided for, the "Elsan Permanent" model. Experts are daily in attendance at the stand and will give detailed explanation of the system.

Ewart and Son, Ltd. (346, 348 and 350, Euston-road, London, N.W.1). **Stand No. 181, Row K.**

Geysers, etc.—This firm exhibit a variety of excellent types of geyser, together with certain building accessories. These include the "Victor" geyser, a low-priced reliable bath heater; the "Lightning" geyser, a standard pattern of high quality and finish.

which will supply bath and lavatory basin; the "Califont" automatic labour-saving type, providing hot water to any tap in any house, upstairs and downstairs; an example of one of the largest geysers ever made, heating 10 gallons per minute; the "Supreme" automatic pressure type for bath, lavatory basin and sink; the "Brilliant" geyser, a small heater of high efficiency for lavatory basin or kitchen sink; the "Ever-Ready" boiler for cafes, restaurants, etc., providing a constant stream of boiling water; Ewart's "Emperor" cowl; all-copper roof ventilators; the "Alcove" porcelain enamelled panelled bath, with Agate porcelain enamelled taps and fittings; the combined bath and geyser—the "Grafton" and "Fitzroy"—inexpensive to instal; and the Ewart No. 66—improved "Boilo" gas copper, with syphonic action for bath supply.

The Expanded Metal Co., Ltd. (YORK MANSION, PETTY FRANCE, WESTMINSTER, LONDON, S.W.1). **Stand No. 139, Row G.**

Expanded Metal.—This firm, who are engineers for all forms of reinforced concrete work, exhibit samples of their products and examples of their uses; also photographs of various works carried out. The reinforcements are as follows:—(1) "Expamet" expanded steel, which has been in successful use all over the world for more than 35 years as reinforcement for concrete roadways, pavings, etc. (2) "RR" 6 in. mesh and treble-layer "Expamet" reinforcement for concrete roadways, pavings, etc. (3) "BB" and "Expamet" lathings for interior and exterior plasterwork; also "Ribmet" for concrete and plaster work. (4) "Exmet" reinforcement for brickwork, concrete-block work, partition slabs, asphalt, etc. (5) Mild steel wall-ties for cavity walls.

Fenlon and Son (Incorporating G. Shrewsbury and Co.) (8, TUDOR-STREET, LONDON, E.C.4). **Stand No. 28, Row C.**

Geysers.—Fenlon's "Shrewsbury" geysers—in various finishes, including polished and lacquered, oxidised, nickel-plated, and the new black and white with labour-saving finish—are shown here. Especial attention is drawn to the "Tudor" geyser, with patent eccentric automatic valve and swing-out burner. The valve is made entirely of metal. This model is in action, as are the "C.C. Fleet" geyser, with patent interlocking gas and water taps, the "Fleet" geyser, the "Wonder" geyser, the "Pressure" geyser. And also shown at work is the "Two-point" geyser, which is said to provide a satisfactory solution to the supply of hot water for a flat or for a small house where the requirements are not great.

Fernden Fencing Co., Ltd. (37, BRIDGE-STREET, GUILDFORD). **Stand No. 37, Row C.**

Fencing.—This stand must surely include every known type of wood fencing, and in addition, exhibits a fine selection of wood doors, gates, etc. The firm's special line is, of course, "Fernden," cleft chestnut pale fencing, but a new type of oak fencing will be noted with interest; known as "Wovenboard," the nature of the fence is implied by its name, and it should be seen by all interested in a cheap, yet attractive, method of screening gardens or other enclosures.

Joseph Freeman, Sons and Co. Ltd. (WANDLE COLOUR WORKS, S.W.18). **Stand No. 285, Row S.**

Cement Colourings.—Specialities for colouring, hardening and waterproofing cement, concrete, plaster, brick, stone, asbestos-cement, etc., both by incorporation and surface application, have a very attractive stand, which takes the form of a small house, decorated entirely, both inside and out, with "Cementone" products. Mr. J. Woollard, an expert on concrete, has himself designed and made the whole of this work. He will be in attendance daily to give information or advice. Among the other exhibits are those showing the use of "Cementone" colours in terrazzo work; some beautiful panels of imitation marble; facing bricks with a fine glazed finish in mottled colours; and ornamental tiles in various designs and colours.

The Gas Light and Coke Co. (HORSEFERRY-ROAD, WESTMINSTER, S.W.1). **Stand No. 304, Row T.**

Gas Appliances.—The Gas Light and Coke Co.'s stand has been designed by Mr. Walter Tapper, A.R.A., P.R.I.B.A. The central lounge hall is used to demonstrate some examples of modern heating by gas, displaying special settings for the latest type of gas fire. A display of modern gas cooking equipment is arranged, comprising one suite suitable for houses costing up to £1,000, and the other suite for houses costing anything above this figure. The remaining portion of the stand is reserved for an exhibition of the suggested methods for constructing the "Economy" gas flue, which is now so popular with builders all over the country. Large-size drawings are available, clearly setting out alternative methods for obtaining satisfactory ventilation of gas fires combined with saving in building costs. Examples of different types of flues constructed in the party wall are exhibited, also the actual flue blocks and terminals for inspection.

J. Gliksten and Son, Ltd. (CARPENTER'S-ROAD, STRATFORD, LONDON, E.15). **Stand No. 87, Row E.**

Hardwoods.—This firm hold a large and choice stock of thoroughly seasoned hardwoods, and are displaying on their stand samples of wainscot oak, American oak, mahogany, American and Ancona walnut, teak, whitewood, etc., a special feature being a log of Cuba, which both in quality and size is exceptional. Visitors wishing to see the firm's storeyards, covering 35 acres, on which are erected several large sheds stocked with every description of seasoned timber, both English and foreign, will be driven there in a private car.

Goodwin, Barsby and Co., Ltd. (ST. MARGARET'S IRONWORKS, LEICESTER). **Stand No. 155, Row H.**

Machinery.—This exhibit of contractors' machinery comprises the following:—One 12 in. by 6 in. patent "Acme" heavy stone-breaker, mounted on travelling wheels with screening apparatus. It can also be adapted as a granulator for producing chippings for concrete work; one 12 in. by 5 in. patent "Acme Victor" concrete breaker, for dealing with blue bricks, old concrete, soft stone. This machine is mounted on travelling wheels; one No. 1 patent open drum concrete mixer with hoist, batch measuring and loading hopper, convertible carriage for end or side loading and discharge, complete with engine and water tank; and one No. 0 concrete mixer, on wheels, for hand or belt power, to take in a batch of 3 to 4 cu. ft. Also exhibited are a model of an improved portable loader and a model of the patent "Acme" granulator.

W. H. Harling (117, MOORGATE, E.C.2). **Stand No. 277, Row R.**

Drawing Instruments.—On this stand are exhibited a full range of this firm's machine-made drawing instruments, packed in convenient pocket cases, suitable alike for the student and the engineer. Also shown is a selection of old English pattern instruments—accurate and reliable. Several new instruments of particular interest are being exhibited, including a portable type of beam compass with a three-piece duralumin lath; an improved form of eidograph, specially lightened and balanced for accurate enlarging and reducing; and a parabolic curve, which is automatically adjustable.

G. A. Harvey and Co. (London), Ltd. (WOOLWICH-ROAD, S.E.7). **Stand No. 248, Row P.**

Metal Equipment.—Special features of this exhibit are as follows:—Ventilators, ventilating piping, zinc roofing, steel equipment suitable for office, works, and modern homes, steel cupboards, steel tables, shelving, adjustable and fixed storage bins, steel works offices, filing cabinets, steel clothes' lockers for works and staff, and steel lavatory partitions. These fitments are economical in initial outlay and can be dismantled and re-erected when and where desired without depreciation. Perforated metals, one of the specialities of the firm, are represented by screens and screen plates suitable for gravel, sand and ballast, also cement machinery plates. Wire window guards of every design are produced, and representative designs are neatly exhibited on model factory and church windows. Woven wire cloths of all meshes and gauges up to 200 mesh are produced. Mild steel tanks, cisterns and cylinders are shown in great variety, also gutters from 18 gauge material to ⅜ in. plate, with a choice of designs to suit the most exceptional requirements.

Saml. Haskins and Bros., Ltd. (WALTHAMSTOW, E.17). **Stand No. 140, Row G.**

Shopfittings, etc.—In this most tasteful stand are displayed—incorporated in the structure—bronze and white metal shopfronts and showcases, with the addition of many fine bronze castings of modern character. Also, four distinct types of "Haskins" rolling shutters:—(a) Galvanised steel rolling shutter, *electrically operated*, similar to those constructed for the shops of the Underground Railway; (b) heavy lath wood rolling shutter, *mechanically operated*, as constructed for breweries, wharves, loading-banks, etc.; (c) wood rolling shutter, *manually operated*, especially designed for a lock-up garage; (d) "Firola," fire-resisting shutter, for party wall openings. The special feature of the exhibit is (a), the most modern type of electrically controlled steel shutter. Many types of bronze, extruded bronze, kalamein and other details complete an exhibit which no architect, storefitter, decorator or shopowner should miss.

Hollis Bros. and Co., Ltd. (UNITED HOUSE, 177, REGENT-STREET, W.1). **Stand No. 152, Row H.**

Woodblocks.—Numerous designs of ½ in. Parquetry in oak, walnut and mahogany, etc., are on view here, also ½ in. by 2½ nominal Bruce American oak flooring; ½ in. by 3 nominal Austrian oak flooring strips, and 1 in. by 3 nominal PTG flooring in European oak, Tasmanian oak, Bruce American oak, and jarrah. Specimens of wood block flooring in beech, pitch pine, birch, European oak, Tasmanian oak, teak, jarrah, and Oregon pine are also to be seen, and in addition the firm is exhibiting samples of the various types of mouldings in the manufacture of which they specialise on a mass production basis.

Hughes and Co., Ltd. (204, GREAT PORTLAND-STREET, W.1). **Stand No. 266, Row R.**

Permanent Floorings.—The demands made upon the floor of the modern building are so heavy that an increasingly high standard is required in the material used for flooring. Such material must be durable; it must be adaptable; it must be hygienic; it must be comfortable; frequently it is also expected to be decorative. "Triolin" has claimed for it the particular qualities called for in every type of building. For the office or the shop it is distinctive and durable. In the factory or the warehouse it is hard-wearing and serviceable. For the school or the hospital no flooring is more hygienic. It is excellent for any public building, whether town hall, hotel, restaurant, or cinema. In the home a "Triolin" floor is an asset. Specimens can be seen and methods of laying can be explained on the stand.

Cowan Hulbert, Ltd. (ABBEY HOUSE, WESTMINSTER, LONDON, S.W.1). **Stand No. 54, Bays. Gallery.**

Concrete Equipment.—On this stand a selection of this firm's concrete-making equipment finds a place. "Insley" concrete placing equipment, "Bex" concrete mixers, "Novo" engines and hoists, "Rooshors" patent self-locking adjustable shores, "Roos" column clamps, "Berg" concrete surfacing

machines and "Crowe" safety saws are among it. A special feature is a series of photographs of other plants and equipments at work. All roadmakers, surveyors and engineers should make a point of visiting this stand when in search of concrete-making equipment and plant.

The "Hurry" Water Heater Co. (39, Broad-street, Birmingham). **Stand No. 182, Row K.**

Water Heaters.—On this stand is exhibited the "Hurry" furnace, for subsidy houses, both coal and gas-heated designs, supplying hot water to baths and for washing clothes. It is stated that one may obtain three hot baths for 3d., with the "Hurry" furnace, gas-heated design, of non-parlour type. It is a patented method, which obviates scum and sediment in the bath Another exhibit is the No. 10 "Hurry" cylinder, giving continuous supply to all hot taps, including kitchen sink, without pressure danger; it is appropriate for subsidy houses, and suitable to all waters. The "Hurry" geysers, of bright copper finish exteriors, or white porcelain, are made in attractive designs suitable for ordinary villa residences.

The Interoven Stove Co., Ltd. (156, Charing Cross-road, W.C.2). **Stand No. 219, Row L.**

Stoves.—This is a good stand, and interesting exhibits are the "Interoven" and "Super-Interoven" convertible cooking and heating stoves, "Pascall's Patent"; also the new "Pascall combination" grate, for cooking all meals and giving an ample supply of hot water and a good open fire when cooking is finished. Also on display are "Bewty" expanding barless fire fronts, "Pascall's patent," for modernising old-fashioned fireplaces and saving coal and labour; also, the "Ten-in-one" adjustable stool bottom grates. Architects for every style of house or building will find something of interest here. A further advantage is that some of the stoves may be seen in action.

G. Johnson Bros. (69-71, Old-street, E.C.1). **Stand No. 44, Row C.**

Metalwork.—The work of the modern metal craftsman is admirably demonstrated on this interesting stand. This old-established firm of architectural metal workers has obviously set itself the task of proving that there is no excuse whatever for the garish signs and bad lettering too often to be seen in the streets to-day, and has done so very effectively. In addition to the usual products of architectural metalworkers, the architect will be interested to see here samples of mouldings, comprising hardwood cores on which are drawn a metal sheathing. The object is to make the fitting of a metal shop front as simple an operation as a wood front, so that it can be undertaken by any builder. This type of moulding is supplied for frames, sashes, and doors, the wood being sheathed in bronze. Standard lengths of moulding are supplied, the joints between which are covered by plain or ornamental pieces specially made for the purpose. Another feature shows name plates in bronze, on which the lettering is applied in opaque and irridescent ceramic enamels. The letters are cast with recessed faces and filled with enamel fired into the letter. Each day a practical demonstration of the art of engraving is given.

Johnson's Reinforced Concrete Engineering Co., Ltd. (47, Victoria-street, Westminster, S.W.1). **Stand No. 105, Row F.**

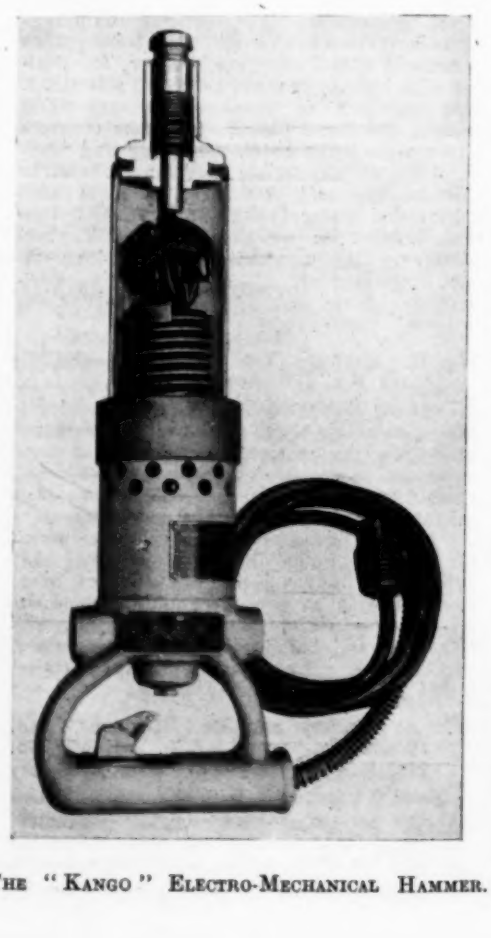
Reinforced Concrete.—This Company is again showing the "Lattice" and "Keedon" system for reinforced concrete structures with samples and models displayed, reminding prospective users of the advantages of the "Keedon" stirrup. Another exhibit is woven fabric, to reduce the labour of steel assembling on the site and risk of displacement during concreting to a minimum. The activities of the Company over a long period of years are demonstrated by some photographs of typical works designed and carried out by the company, who are now in a position to carry out the complete work, thus eliminating divided responsibility. "Bricktor" reinforcement for brickwork is also well demonstrated, showing the enormous strength given to brickwork by its application, making it possible to have a thinner wall of the same strength and also preventing cracks due to uneven settlement. It is to be especially noted that the company make a feature of service after delivery of their reinforcements by visiting the works to assist the foreman and others in the application of the material.

Jones and Attwood, Ltd. (Titan Works, Stourbridge). **Stand No. 177, Row J.**

Boilers, etc.—This firm specialises in boilers for hot water supply and heating purposes to fill almost any need for houses, garages, greenhouses, etc. Each is designed to give maximum heat at minimum cost for fuel and upkeep. The exhibits are as follows:—Open-fire boilers for domestic hot-water supply; the "Batheater" combined boiler and cylinder; boilers for central heating; greenhouse and garage heating apparatus; hot-water pipes and connections.

Kango Company, Ltd. (78, Petty France, Westminster, S.W.1). **Stand No. 233, Row O.**

Electro-Mechanical Hammer.—The Kango electro-mechanical hammer has, during the last 12 months, been vastly improved in many ways, the most important being the new type of transmitter now fitted. Hitherto, when the switch was depressed, percussion immediately took place, *i.e.*, the hammer could not be run light. The new type of transmitter which has been evolved obviates this, percussion only taking place when the tool is actually held up to the work in progress. When not actually working, although the switch is in the "on" position, the motor disconnects, thus saving all wear and tear on the striking mechanism when the tool is not actually at work. The hammer is a self-contained unit, instantly connectable to any permanent or temporary lighting circuit. Weighing only 9½ lb., the motor is universally wound for A.C. or D.C., greatly increasing its utility and field of operation. It may be used for hole-jumping in brick,



The "Kango" Electro-Mechanical Hammer.

stone and concrete, chase-cutting in similar materials; for tooling cast-stone; and also for vibrating wood or iron moulds. Its uses are demonstrated on the stand.

Kerner-Greenwood and Co., Ltd. (King's Lynn). **Stand No. 45, Row C.**

Cement Waterproofer.—This is a most tasteful exhibit and is at the same time one in which the practical uses of waterproofed concrete are well displayed. Among the many models shown is a lily pool lined with waterproofed cement bordered on one side by grass-turfed banks. These grass banks are not merely decorative, but, being kept wet, provide a test of the vertical dampcourses of waterproofed cement applied to the porous walls against which they are placed. A wall, stuccoed on one side with sand and cement waterproofed with "Pudlo" brand powder, has a stream of water running continuously down the waterproofed cement surface—a very stringent test. A very interesting model represents a corner of a cellar and the various stages of waterproofing with "Pudlo" brand powder and cement are shown. To interest those who have a partiality for laboratory tests, there is a machine by which hydraulic pressure up to 300 lb. per square inch is imposed upon samples of cement waterproofed with this powder. The background to this comprehensive exhibit is provided by a stand of quiet design, but, as is fitting, architectural in character. The lighting—from concealed lamps—gives a diffused glow which accentuates the cornice line of the pavilion.

J. A. King and Co., Ltd. (181, Queen Victoria-street, E.C.4). **Stand No. 103, Row F.**

Concrete and Plaster.—This stand has a special display of concrete and plaster building units, some of which are the patented products of the firm. There are useful lines of concrete partition blocks and wall blocks in various sizes and thicknesses; plaster slab partitions; plaster slab ceilings; a method of building slab roofs to supersede roof boarding and rafters; and pugging slabs. Concrete in combination with other materials is shown in the reinforced concrete glazing bar and reinforced concrete-frame pavement lights, roof lights and floor lights. A new type of hollow floor tube construction is also shown; this needs no centring, and is obviously a simple and inexpensive method of floor-laying. This is a stand which the architect and builder in search of something new should make a point of seeing.

The Kleine Patent Fire-Resisting Flooring Syndicate, Ltd. (135-6, High Holborn, W.C.1). **Stand No. 108, Row F.**

Fireproof Flooring.—This company makes a special display on its stand of "Duromit." This substance is composed of crystals and crystalloids, which, it is claimed, prove harder than any iron or steel. The binding material of the substance is cement and a surface of "Duromit" is guaranteed by the makers to withstand the heaviest traffic, to remain free from dust and to remain waterproof and non-slippery. "Duromit" surface is either laid *in situ* with a cement mortar backing or used as a surface for manufactured slabs. Full details of application, cost and effect of finish are given on the stand.

Lafarge Aluminous Cement Co., Ltd. (Lincoln House, 296-302, High Holborn, London, W.C.1.). **Stands Nos. 268 and 269, Row R.**

Cement.—"Ciment Fondu" and Lafarge extra white cement are shown on these stands, and the fullest technical information is available for those interested in obtaining the latest data regarding the qualities of these products. Details of the work which has been carried out during the past five years with "Ciment Fondu" in this country are illustrated by photographs and descriptive data. Sample panels of various finishes and renderings made with Lafarge extra white cement are shown. A speciality is made of

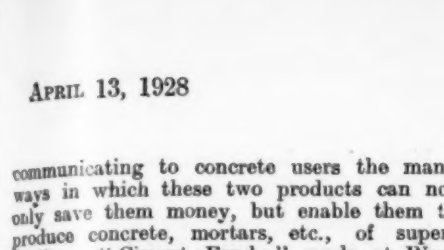
communicating to concrete users the many ways in which these two products can not only save them money, but enable them to produce concrete, mortars, etc., of super-quality. "Ciment Fondu," made at West Thurrock, Essex, is an aluminous cement which ensures that all concrete made with it is rock-hard 24 hours after placing, with a continuous increase of strength with age. Lafarge extra white cement is a product of the Lafarge quarries, and is a non-staining white cement.

W. T. Lamb and Sons (43, Shoe-lane, E.C.4). **Stand No. 131, Row G.**

Bricks, Tiles, etc.—This firm have this year followed their usual method of displaying a selection of their many different types of bricks and tiles, etc., by actually building them into a charming and useful structure, which takes the form of a "woodland shelter" (see p. 635). Not only have tile "shingles" been employed to form the conical roof, but tiles, too, have been fixed to the soffit from eaves to brickwork. Thus the roof makes a very bold feature. The roof is supported on piers forming four bays of different types of bricks and four columns of spiral brickwork. Inside the "shelter" is a brick fireplace of striking design. The platform is built of the firm's "repressed Flettons," edged with two different types of paving bricks and covered in with their Cornish crazy paving and Sussex and sand rough quarry tiles. The posts holding the chain are of Sussex quarry tiles built in spiral form and capped with small brick balls. The stand was designed by Sir Aston Webb and Sons, and built by Messrs. Higgs and Hill, Ltd., the roofing tiles being fixed by Messrs. Lambs' roofing staff.

James Latham, Ltd. (Head Office: 124, Curtain-road, London, E.C.2). **Stand No. 137, Row G, and Stand 144, Row H.**

Hard Woods.—Hard woods of every description, home and foreign grown, are shown on this stand, including mahogany, several varieties of Cuba, Honduras, Spanish, Tobasco and African, in finely figured as well as plain, boards, planks, and veneers; oak, including Austrian, Volhynian, Slavonian, Japanese, American and English; British brown oak; teak—Moulmein, Java, Rangoon, Mahoborn (Borneo), both in plain and highly figured



Stand of Messrs. James Latham, Ltd.

boards; walnut—both American and French. An important exhibit is a stack of Austrian wainscot oak. Ply panels in figured woods offer great possibilities for decorative panelling of rooms and halls. Some examples of a plain, cheap description of oak-faced ply-wood panelling, eminently suitable for cottage property, are shown. A small office is constructed of ply-wood and shows the adaptability of this wood for medium and high-grade panelling. The entrance door to the office is a "Mahtal" flush door, faced on one side with choice figured walnut and on the other with mahogany.

Lee and Pouracre (Steventon Engineering Works, Steventon, Berks). **Stand No. 66, Row D.**

Block Machines.—Practical demonstrations are here given of the "Lee Magnum" concrete moulding machine, which produces blocks, slabs or bricks in either ballast, concrete or breeze. This machine, which has been on the market for several years, is strongly built of steel. It is hand-operated, and a useful and reliable machine for producing such units at low cost.

The Leeds Fireclay Co., Ltd. (Wortley, Leeds; and Leeds House, 2, Cavendish-Place, London, W.1). **Stand No. 96, Row E.**

Terra-Cottas.—Burmantofts terra-cottas are displayed as features of this stand in Tuscan columns made in several new types and finishes, and clearly show how this material lends itself both constructionally and decoratively to buildings of every class. The Strand Corner House; the Park-lane Hotel, Piccadilly; Messrs. Lyons' New Oxford Corner House, Oxford-street; and the large extensions to the Strand Palace Hotel are conspicuous examples of the successful use of Burmantofts "Marmo Faïence" in London. Glazed bricks in the many varieties now available display still further the extent of this Company's manufactures and the possibility of the application of permanent colour to architectural treatment. Other exhibits include "Lefco" terra-cotta fireplaces, and a sanitary exhibit comprising some examples of "Imperial" porcelain white-glazed fireclay ware.

Lewisham Timber Co., Ltd. (Lewisham Bridge, S.E.13). **Stand No. 122, Row G.**

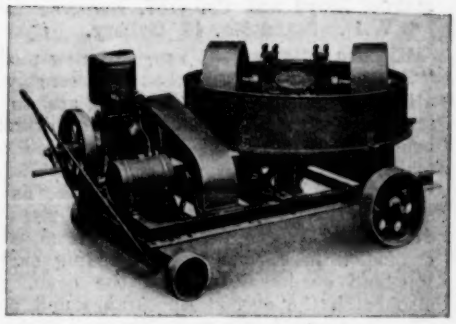
Fencings and Gates.—The gates shown on this stand are in English, American and Austrian oak, and include some original designs, but the main intention is to convey an idea of workmanship. Sections of oak fencings have been erected, and it is of interest to note that the company make a speciality of supplying this type of fencing in panels ready to erect. The wire pale chestnut fencing exhibits are taken from stock, and particular attention is directed to uniformity and strength of the material. This fencing has been accepted as "a standard of its type" by H.M. Government Departments, and many leading authorities. Rustic fencing made in panels ready to erect, also shown, appeals to architects and builders as an attractive but economical fence. Apart from their own exhibits the Company are prepared to work to architects' designs.

The Leyland and Birmingham Rubber Co., Ltd. (Leyland, near Preston, Lancs). **Stand No. 272, Row R.**

Rubber Floors.—Here is exhibited a complete range of the different colours and thicknesses in which the firm can supply rubber floors, and illustrated booklets, pamphlets, etc., on the subject may be obtained at the stand. A Leyland rubber floor is essentially quiet, clean and sanitary, and these properties, together with the ample range of colours in which it can be obtained, make it a highly suitable material for covering floors, staircases, etc.

The Liner Concrete Machinery Co. (Glasshouse Bridge, Newcastle-on-Tyne). **Stand No. 281, Row S.**

Concrete Mixers.—Among the exhibits of this well-arranged stand is the "Liner" patent semi-plastic concrete mixer, driven by 3 h.p. Lister petrol engine. It is guaranteed, we learn, to mix semi-dry, semi-set or semi-plastic concrete with absolute efficiency without possibility of balling or separation of materials. It is designed for the mixing of facing materials, as it not only thoroughly mixes them but kneads them together; it also mixes wet concrete. The machine crushes breeze, rough clinker, and similar materials, and makes sand-lime and sand-cement mortar. Another exhibit is the "Liner" improved tilting drum concrete mixer. This is the 4/3 size, trailer type, having a batch capacity of 3 cubic feet of mixed concrete that is driven by a 1½ h.p. engine. Some of its advantages are, we learn, that it has a large diameter drum to ensure perfect mixing without "balling" or separating; the drum spindle runs in top and bottom double purpose type ball bearings, guaranteeing a very long life; it is very strongly built and mixes sand-lime and sand-cement mortar and hair plaster just as efficiently as it mixes

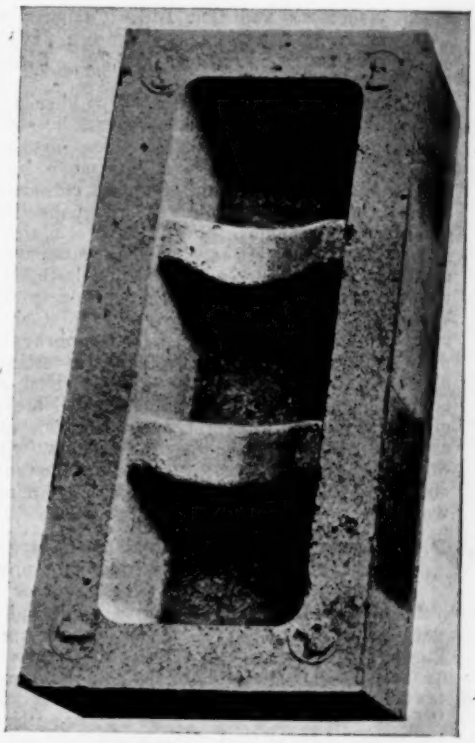


The "Liner" Semi-Plastic Concrete Mixer.

wet concrete. The "Liner" patent combination slab, block and brick machine, and the "Liner" patent face-down block machine are other interesting exhibits.

London Brick Co. and Forders, Ltd. (Africa House, Kingsway, W.C.2). **Stand 126, Row G.**

Bricks.—This company's well-known product, "Phorpres" Fletton bricks—700 millions of which were used in 1927—are used for the interior of the stand's ante-room. Multi-coloured rustic bricks are used for the external structure. These provide an artistic and pleasing face-brick at a moderate cost. An exhibit of particular interest is a 9 in. wall constructed of the company's latest product (shown herewith), a patented cavity brick giving honeycomb or sealed-cell construction with a very considerable saving in weight; further technical information may



The Patented "Cavity" Brick.

be obtained at the stand. Around the stand are photographs of some of the company's works and plant, which convey some idea of the resources required to produce an output of two-and-a-half million bricks a day.

H. J. and C. Major, Ltd. (The Patent Tile Works, Bridgwater, Somerset). **Stand No. 170, Row J.**

Patent Tiles, etc.—Patent interlocking Roman tiles, angular, Grecian, Welbeck and plain tiles, ordinary Roman, treble, and pan tiles, ridges and finjals, bricks of every description, also Bath bricks for polishing purposes, are here exhibited in profusion. Messrs. Major's patent tiles are extensively used on many public buildings in the British Isles and in the Colonies and numerous housing schemes throughout the country.

Manuel Lloyd and Co. (137, Regent-street, W.1). **Stand No. 46, Gallery.**

Kitchen Fittings.—A range of new models "Savework" fitted kitchen dressers with attractive labour-saving features are to be seen on this stand. "Clip-on" sink draining boards, really well made of hardwood and teak, and "Automatic" folding wall tables with porcelain tops also find place, as do some entirely new designs for closed-type dressers. Smooth-top gas cookers, white enamelled inside and out, including enamel top and gas-burner outside the oven, will also catch the eye. Appearance and price are further features. No architect or builder specifying labour-saving kitchen fittings should miss this stand.

A. Maxwell (6, St. Paul's Square, Liverpool. London Office: 51, Fenchurch-street, E.C.3). **Stand No. 85, Row E.**

Roofing.—The group of models at this stand illustrates the use of Rito on several kinds of roofs. Used as a covering or repair material, the principle employed is the production of a material that always retains sufficient elasticity to withstand the strains of expansion and contraction, which are heaviest upon roofs. Being self-adherent, tenacious in grip, this bituminous compound, reinforced with asbestos and a tough granular mineral, is claimed to meet climatic conditions in all parts of the world and ensure an all-weather-proof seal on any kind of modern roof—tiles, slate, concrete, asphalt, asbestos slates or metal. Other exhibits include Ritolastic, the liquid form of Rito, for the treatment of corrugated iron roofs, etc.; Romanite cement and concrete hardener; and Veevic decorators' soap.

Chas. Macintosh and Co., Ltd. (Cambridge-street, Manchester. London: 22/23. Jewin-street, London, E.C.2). **Stand No. 295, Row T.**

Rubber Tiling.—"Macintosh" rubber tiling, rubber stair coverings, stair treads, stair nosings, cove bases, all find place on this stand. A neat device—a rubber cove base in contact with walls and floor at corners—is of interest, as it eliminates dust collection and ensures perfect cleanliness. Other articles having good display are rubber mats and matting, and rubber bath mats and bath curtains, while among the rubber products for building and allied trades are "Macintosh" moulded hose, belting, buffers, diaphragms, door stops, gaskets, gas bags for drain-testing, electricians' and industrial gloves, push-on connections, basin plugs, rubber-headed tacks, silencers, squeegees, sheet and insertion, gas and acetylene tubings, valves, washers, window glazing strip, etc., etc. Further are shown waterproof garments for surface workers.

F. McNeill and Co., Ltd. (Head Offices: 14/24, Lamb's Passage, Bunhill-row, London, E.C.1). **Stand No. 168, Row J.**

Roofing Felts, etc.—Here are exhibited a very extensive variety of "Lion" brand roofing and roof lining felts. The chief points of quality about these felts are their fine and even texture, and their solidity and pliability. "Lion" roofing, a high-grade bitumen "rubber-type" felt, is made in various thicknesses and suitable for all climates—as supplied to the British Government. The "Combinite-Bitumen" system of roofing for flat or sloping roofs is shown, also corrugated iron roofs covered with a special method of felting. For cold storage insulation, and thermal insulation generally, "Slagbestos" (perfected slag-wool) is largely used both ashore and afloat in the largest and most modern cold stores and steamers. It is also largely used for sound-deadening. The firm are manufacturers of dampcourses to the Ministry of Health's specifications.

Medway's Safety Lift Co., Ltd. (1-2, Silex-street, London, S.E.1). **Stand No. 39, Row C.**

Lifts.—That they "have a lift for every purpose" is the claim of this firm, but it is obviously impossible to show more than a very small selection within the limited space of an exhibition stand. But those on view have been specially selected for their interest to architects and builders, and afford a good demonstration of the degree of "foolproofness" and efficiency the modern lift has attained. The principal exhibit is a latest-pattern worm-geared electric lift equipment, with V sheave drive, electrically-operated control panel, and rheostat. Two service lifts are on view; one operated by electricity, suitable for private residences, and the other a hand-operated lift fitted with a self-sustaining gear. A special feature of the stand is an automatically-operated opening and closing device for lift doors, a device which is, we think, unique.

The Merchant Trading Co., Ltd. (52, Bishopsgate, London, E.C.2), in conjunction with **The Celotex Company of Great Britain, Ltd.** (323/6, Australia House, Strand, W.C.2). **Stand No. 259, Row Q.**

Insulation Board.—On this stand are demonstrated the uses of "Celotex," the insulating and sound-deadening board. As a medium for highly decorative effects, the various applications of "Celotex" are demonstrated, e.g.:—As ceiling and wall lining; as a sound deadener in partitions or floors; as a means of changing cold hard floors into warm floors with a comfortable tread; as permanent shuttering to ensure a warm dry concrete wall or ceiling, etc. The various applications enumerated are substantiated by reference to photographs of actual work carried out. These photographs demonstrate the application of "Celotex" under every variation of climatic conditions in different countries throughout the world. The stand itself is the best advocate for the materials, and is one which every architect, builder or layman should inspect.

Metal, Ore and Chemical Co., Ltd. (5, Water-lane, London, E.C.3). **Stand No. 70, Row D.**

Bricks.—This is another stand on which the attractiveness of brick as a building material is well demonstrated. The principal features are multi-coloured facing bricks and red sand-faced facing bricks; the former are hand-made, while the latter are a cheaper line specially made for housing schemes.

Middleton Fireclay Works (Middleton, Leeds. London Depot: St. Pancras Goods Station). **Stand No. 88, Row E.**

Fireclay Goods.—An effective central feature of this stand is four pairs of Corinthian columns in various classes of terra-cotta. A set of island and central site urinals, etc., showing the use of glossy imitation granite and white-glazed material is an interesting exhibit, while another feature is a miniature swimming bath, complete in every detail, as supplied to local authorities. Examples of sanitary ware, sinks, wash-tubs, etc., and glazed bricks and tiles are also exhibited.

E. Morley and Sons (Derby), Ltd. (Exeter-street, Derby). **Stand No. 83, Row E.**

Joinery Manufactures.—The exhibit consists of staircases of various types with "non-creak" treads; casement windows, which are guaranteed weather proof, and joinery to architects' details. The goods exhibited are, we believe, average samples of this firm's productions, and special attention is drawn to their quality. Other exhibits include a kitchen dresser, cupboard front, vestibule door and framing, entrance gates, doors—all properly mortised and tenoned—drainers, and bull's-eye windows, etc.

The National Flooring Co., Ltd. (183, Hammersmith-road, W.6). **Stand No. 205, Row L.**

Wood Block Floors.—Parquet flooring in all kinds of hardwoods from ¼ in. thickness go towards making a useful exhibit. An unusual and novel display is made by the patent spring portable parquet dancing floors, specially prepared from Macassar ebony, and of great value where a room is required for other purposes than dancing, when the sections may be lifted without trouble. Spiral spring dancing floors; oak "Parlok" panelling; "Parlok" wood block flooring in all kinds of woods, are also shown. Demonstrations of floor surfacing and polishing by hand or machine are also given, while several lines of non-cracking terrazzo and mosaic flooring are in a display which is of the keenest interest to architects who are designing dance halls, town halls, schools and public and private buildings of all kinds.

Naylor Brothers (London), Ltd. (Office, Works and Laboratories: Slough, Bucks). **Stand No. 280, Row S.**

Paints, etc.—On this stand are shown the complete range of Nobel-Taylor finishes for every purpose, including varnishes, paints, enamels, distempers, stains, wallpapers, leather wall finishes and brushes, and amongst the specialities shown are "Suwidec," "One-Coat Oak," and "Red-Label Oak" varnishes, "S.E.G." and "Supermatt" paints, "Nayrodec" water paint, "Petrumite" imitation stone paint, scrumbles, coloured enamels and "Brushing Belco." Also exhibited are specimens of "Rexine" and "P.V." leather cloth wallpapers, the Watson-Foster, Colin McArthur, Stauntons' "semi-trimmed," Boxer 30 in. "Maximur" and "Windsor" wallpapers, the Boechk British-made brushes, and "Melanoid" bituminous paints and "Tectal" wood preservative. The stand is an imposing mahogany structure which forms a suitable frame for Nobel-Taylor products, and a special item of interest consists in the two kiosks showing different decorative designs carried out with the firm's materials, such designs including the painting of landscapes with "Supermatt" flat oil paint and "Nayrodec" water paint, besides many scumble designs, coloured enamel tinting, etc.

John M. Newton and Sons, Ltd. (20-23, Charles-street, Hatton Garden, E.C.1). **Stand No. 192, Row K.**

Glass.—This firm is showing in well-arranged display plate-glass, worked in every way necessary to the building trade, together with leaded lights, copper lights, and also "Vioray," which, allowing as it does additional light and more free passage of ultra-violet rays, is most suitable for glazing work at schools, hospitals and institutions of all kinds, besides ordinary domestic work.

The North British Rubber Co., Ltd. (Castle Mills, Edinburgh, and 200/208, Tottenham Court-road, London, W.1). **Stand No. 267, Row R.**

Rubber Flooring, etc.—North British rubber flooring is suitable for public buildings, banks, offices, hospitals, theatres, cinemas, hotels, etc., and for vehicles and lifts. The range of flooring includes "Paraflor," which is made in ⅛ in., 3/16 in., ¼ in. thicknesses, in plain and marbled colourings, and made in 3 ft. and 4 ft. widths. Tiled "Paraflor" can be laid in a large variety of patterns to harmonise with furnishings and decorative schemes, a special feature being "Parquet" tiled "Paraflor." Other specialities include inlaid rubber tiling, stair treads, rubber mats and matting for entrance halls, corridors, etc., as well as sundries for the building trade, and rubber products for contractors, road engineers, etc.

Novocrete and Cement Products Co., Ltd. (Stonebridge Works, Park Royal, N.W.10). **Stand No. 274, Row R.**

Special Building Material.—The "Novocrete" building shows a type of construction suitable for bungalows, garages, sports pavilions, club houses, etc. It is entirely built of "Novocrete" lumber, which is claimed to be fireproof, weatherproof, vermin-proof, rotproof, and which can be nailed, sawn and screwed. The building is composed of hollow walls of 1½ in. panelling, the outside in natural state and colour, the interior in various coloured scoured and polished panels. A stack of "Novocrete" gas flue blocks is shown, and the roof is in "industrial roofing." Various types of "Novocrete" Broselev pattern roof tiles are also shown.

[For O'Brien, Thomas and Co., see page 645.]

Frederick Parker, Ltd. (Leicester). **Stand No. 127, Row G.**

Road-making Plant.—Simplicity, strength and speed of operation are the keynotes of

Messrs. Parker's road-making and building plant exhibits at the exhibition. Some of the plant will be seen in action—notably the O.C. type "Parker" mixer, which has proved so popular in concrete work. Among Messrs. Parker's exhibits is the O.C. type "Parker" mixer; this open-drum type mixer of 7 cubic feet capacity is notable for unusual lightness, compactness and rigidity. Power is by 3½ h.p. Lister engine and the drum has internal blades to ensure "perfect mixing and no grading." It is very fast in operation, we learn. The loading hopper is of the accepted Parker design, giving a very light lift. The machine is convertible "on the spot" from side to end loading by a simple operation. Also shown is the "Little Giant," which is an exceptionally strong and efficient machine and proves invaluable in situations where lightness and mobility are important considerations. The display includes also the "Monarch" granulator, the "Monarch" stonebreaker, the 10 cwt. "Monarch" hoist with engine, and the Parker one-wheel and two-wheel barrows.

Thos. Parsons and Sons (315-317, Oxford-street, London, W.1). **Stand No. 130, Row G.**

Enamels and Paints.—Exhibits here include "Endelline" enamel. This is a splendid quality of enamel for interior or exterior use, producing a porcelain-like finish that may be repeatedly washed without deterioration. Also shown is "Endelflat" enamel, an excellent flat enamel for interior use, producing a delightfully soft, almost dead flat finish of a perfectly hygienic and washable character. "Lacreite" enamel provides a satisfactory substitute when work will not bear the expense of a higher quality enamel like "Endelline." It affords very good results either for inside or outside work. Worth noting is "Unicote" flat finish, which is not a distemper, but a distinct innovation in wall decorative material. The surface can be repeatedly washed without deterioration. Other products on view are Parsons' "Gloss Paint," Parsons' "Undercoating Body White," the ever-valuable "Parso-Glaze," and "Parso-Stain." Demonstrations in the use of Parsons' rubber stipplers in conjunction with "Parso-Glaze" will be given on the stand.

The Patent Tip-up Bath Co. (Bath House, Broad-street, Birmingham). **Stand No. 218, Row L.**

Tip-up Baths.—Darby's patent tip-up baths are still required where space is limited. These are made in all sizes and metals of all sheet copper type (tinned on inside), sprayed aluminium or copper colour on outside. The hot water supply is arranged on the patented overflow method, from a "Hurry" furnace, or it can be arranged from back boiler system. Architects who contemplate housing schemes should not fail to inspect this stand.

Peskin, Ltd. (36, Kingsland-road, E.2). **Stand Nos. 223 and 224, Row M.**

Veneer and Timber.—This exhibit will be of interest to most shopfitters, joinery and cabinet manufacturers, for this firm supply finished panels in any kind of walnut to user's requirements. Also French walnut timber. Motor body builders, carriage builders, railway coach builders, etc., shipbuilders, mantelpiece manufacturers will also find this stand of interest. Some fine interior panelling for rooms, etc., is also on show. We learn that all their veneered panels can be made to specified sizes and in sets to the architect's specification.

C. A. Peters, Ltd. (Stores-road Works, Derby). **Stand No. 64, Row D.**

Wood Preservative and Coloured Cements.—"Carbolineum" wood preservative and "Peteroid" coloured cements are two of the specialities of this firm, and the stand is principally devoted to their display. The former is exhibited by a series of different kinds of wood, on which the preservative has been used, showing the effect and colours. Coloured cements are demonstrated by sample panels, which show how they may be used for a variety of decorative purposes. In combination with selected aggregates, too, attractive colours may be obtained on concrete surfaces and stuccos, and these applications are also demonstrated by sample panels. Messrs. Peters, by the way, are one of the few firms in this country who specialise in the supply of special and fancy aggregates for "exposed aggregate" concrete work.

G. D. Peters and Co., Ltd. (Caxton House, Tothill-street, Westminster, S.W.1). **Stand No. 282, Row S.**

Wall Board.—This stand itself is in the form of an entire room, having the walls and ceiling panelled in waterproof "Sundeala" board. The panelling is simply but effectively executed in a colour scheme of buff and oak, with a dado of brown embossed leather panels. Examples of "Koirah" insulation board are shown. The various embossed and decorated types of "Sundeala" are also exhibited, as are many special decorative finishes. The marble effects obtainable by the use of a cellulose paint process are especially worthy of note. "Sundeala" is homogeneous, possesses great rigidity and strength, and requires few battens, thus reducing labour and material costs. It is claimed not to warp, blister or split under changing temperatures, and to be unaffected by heat, damp or cold.

J. and F. Pinder and Co. (26, Lordship-lane, Tottenham, N.17). **Stands Nos. 25, 26, Row B.**

Steelwork.—The advantages of steel partitions, doors and shelving, and steel office furniture, such as cabinets and lockers, are now thoroughly recognised. Their manufacture has resulted in the creation of a large new industry in the past few years. On these stands may be seen a very wide selection of all kinds of steel interior fixtures, ducts, sewage distributors, etc., forming a very useful display.

E. Pollard and Co., Ltd. (Head Office and Works: St. John-street, Clerkenwell, London, E.C.1). **Stand No. 145, Row H.**

Shop Fittings.—On this stand there is a good display of shop and storefitting specialities, as follows:—Steel shutters. The "Rolador" patent ball-bearing steel shutter is simple and efficient in action, has perfect balance, and is easy in operation. Laths are of 14 B.W.G., specially designed to give lightness and strength. The shutter coils in a minimum dimension upon spring boxes of original construction. The fire-resisting pattern for party-wall openings embodies an important new device for controlling speed of descent. A full-size "Rolador" shutter is erected on the stand for demonstration. The metal work includes drawn and extruded bronze sections in great variety for storefitting purposes; bronze-faced hardwood, and stainless steel utilised for furniture and equipment. Specimens are on view at the stand. The firm are the patentees and sole manufacturers of "Kwik-serving" storefittings, and specialists in the planning and erection of shopfronts and equipment. They have a complete storefitting organisation at the disposal of architects.

Thomas Potterton (Heating Engineers), Ltd. (Cavendish Works, Ravenswood-road, Balham, S.W.12). **Stand No. 40, Row C.**

Water Heaters.—This stand is a practical demonstration in the first place of the very wide range of water heating apparatus supplied by a firm that specialise in its manufacture; incidentally it demonstrates the increasing popularity of gas as a heating agent for boilers. Messrs. Thomas Potterton have been responsible for the manufacture of many installations of water heating apparatus of large capacity, such as for factories, hospitals, etc., and here is given an idea of their activities in this direction. The company's "Victor" gas boiler for domestic use is well known—those not familiar with this apparatus are recommended to make certain not to miss an inspection of the models on view. The firm's latest contribution to the science of heating takes the form of a sectional gas boiler for central heating, embodying a new system of radiant panel heating by hot-water circulation fired by gas. The same system may be used, but with the panels gas-fired, and both methods are shown in operation, together with a panel heated by gas direct. Other features of the stand include standard types of sectional boilers for central heating and a small installation with circulating water radiators heated by gas and automatically controlled; the latter should particularly appeal as a supplementary heating equipment for offices or residences. Many of the boilers may be fired with smokeless fuel.

Ransomes and Rapier, Ltd. (32, Victoria-Street, Westminster). **Stand No. 38, Row C.**

This firm, who for the past 20 years have been engaged in manufacturing "Ransome" mixers, are exhibiting co-jointly with Messrs. Cochran and Company (Annan), Ltd. The smaller mixer, known as the "Ransome" featherweight, has a batch capacity of 4½/3½ cu. ft. and an average output of 24/30 cu. yds. per 8-hour day. It is an excellent machine for the average small builder. The "Ransome" lightweight is a somewhat larger mixer, having a capacity of 7/5 cu. ft. and an average output of 40/50 cu. yds. per 8-hour day. All levers are placed on the machine for easy operation by one man. The direct-coupled barrow hoist is usually supplied as an extra. Apart from the foregoing, the firm manufacture a still larger tilting drum mixer having a capacity of 13½/10 cu. ft.; all sizes of rotary drum mixers are also manufactured. All types of drive can be fitted to suit any special requirement—petrol, paraffin, compressed air, steam or electric. The "Ransome" tip cart has a capacity of 6 cu. ft. (approximately three ordinary barrow loads).

Rapoloid (Northend-Road, Wembley Park Exhibition Grounds). **Stand No. 49, Gallery.**

Cellulose Enamels, etc.—"Rapoloid" is a cellulose paint that, because of its many excellent qualities, should attract a good deal of attention. The following advantages are claimed for it: It is non-inflammable, practically odourless, is as easily applied as ordinary paint, is as cheap as good enamel and very durable, dries speedily in most trying atmospheric conditions, is genuinely washable, and has exceptional obliterating power. A special point is that it combines the finished effect of cellulose paint with great ease of application, and is brushable over the largest surface.

Rawlplug Company, Ltd. (Rawlplug House, Cromwell-road, S.W.7.) **Stand No. 55, Row D.**

"Rawlplugs."—These outfits of fibre plugs, screws and boring tools, a simplification and improvement of the carpenter's method of using wood plugs for fixing in brickwork and plaster, are now so well known as to take their place with nails and screws in the tool store of many builders. Those who are not familiar with their use may see a demonstration showing how screws may be fixed in plaster, brick, concrete or marble without breaking away the wall or danger of slipping. The company also supplies non-tarnishing bathroom fittings, liquid porcelain, waterproof adhesive, etc., all of which may be seen exhibited.

Rhodes Chains, Ltd. (8-10, Charing Cross-road, W.C.2). **Stand No. 47, Row C.**

Chains, etc.—This firm displays sash hanging appliances, including new sash chains and patent sleeve bearing pulleys. A large range of other types of pulleys to suit all classes of work is also shown, such as the ordinary round and square grooved axle pulleys and cog wheel pattern together with the ball-bearing pulleys with cog and grooved wheels. Demonstrations may be seen of various types of sash chains used in connection with these

pulleys. They can be used to take the place of existing sash cords as they break, and should appeal especially to owners of property, estate agents and surveyors. Chains for all purposes as used in the building trade are shown, including steel, copper and brass chain for suspending, driving, lifting and pull-down purposes. The company are now handling Greenwood's patent larder lights, skylights and ventilators and have an interesting exhibit of these goods, which are claimed to ensure perfect and permanent ventilation.

Ripon Steel Co., Ltd. (Ripon, Yorks). **Stand No. 6, Row B.**

Steelwork.—A further step in the standardisation of building materials and methods is to be seen on this stand in the form of steel building frames of standardised spans. These should be particularly useful for such structures as garages, workshops, small halls, sheds, etc. The standard spans are 16 ft., 21 ft., 25 ft. and 29 ft., and any length can be supplied immediately from stock. For long-span buildings a new design is demonstrated, by which it is claimed considerable economies can be effected in erection costs; this should be of special service for the erection of garages and such-like buildings where the presence of internal columns is undesirable; by this method, clear spans up to 120 ft. can be readily obtained. Other features of the stand are asbestos-cement goods, sliding doors, steel casements, rainwater goods, etc.

Rippers, Ltd. (Castle Hedingham, Essex). **Stand No. 53, Row D.**

Wood.—This is a stand which needs no embellishment, either on the part of Messrs. Rippers to make it look more attractive or on our part to describe it. It is a reproduction in English oak of a Tudor hall and staircase, with a panelled room inside. Throughout the oak is left in its natural colour, except for a treatment which faithfully reproduces the effect of age. A stand such as this is an education in itself, demonstrating not only the natural beauty of this home-grown timber, but also showing how skilfully our leading hardwood firms can select the wood for each part of such a structure, so that none of its beauty is lost. In the upper part of the stand are to be seen the firm's standard joinery for housing purposes, which exhibit the same care in selection and manufacture as has so obviously been taken with the remainder of the stand. Architects will also be interested to see here a patent hospital door.

Thomas Robinson and Son, Ltd. (Railway Works, Rochdale). **Stand No. 125, Row G.**

Woodworking Machinery.—A speciality is made here of three of this firm's machines for woodworkers' use. These are the straight-line edger, type R.N.; the moulding and planing machine, type R.D.; and the two-spindle circular moulder, type S.G. This last—motorised or belt-driven—is of an entirely new design for working curved, irregular, and straight mouldings as required by joinery and cabinet makers, and in railway carriage and wagon works, shipbuilding yards, etc. The type R.N., fitted with chain feed and ball-bearings, is a new design of machine for accurately edging and ripping boards at high rates of feed. The travelling chain bed ensures perfectly straight sawing, leaving the edges suitable for glueing up. It is an exceedingly valuable machine for joinery and cabinet makers. The moulding machine, type R.D.—fitted also with ball-bearings—is made with either four, five or six cutter-heads. This machine is for moulding either hard or soft timbers, and will also plane, match, tongue and groove, operating on all four sides at once. Particular attention has been given to the provision of means for quick setting up. Cabinet makers and woodworkers should make a point of visiting this stand.

Roneo, Ltd. (5-11, Holborn, London, E.C.1). **Stand No. 102, Row F.**

Steel.—What can be done by a firm with large resources when it applies itself to solving a new problem is admirably demonstrated on this stand. The post-war scarcity and dearness of well-seasoned wood suggested the possibilities of another material for purposes of which wood had been exclusively used before, and owing to its comparative cheapness, its fire-resisting and space-saving properties, steel came to mind as a substitute. The development of the use of steel doors, steel cupboards, steel partitions, steel shelves, steel screens, and a host of other interior fittings in steel, is known to all. We learn that even steel desks have now been supplied by Messrs. Roneo to the Midland Bank, Ltd. This stand is one of the most comprehensive collections of such steel fittings we have seen, and should appeal to architects and builders wishing to keep up to date with the requirements of modern commercial firms.

Rubber Growers' Association (Inc.) (2-4, Idol-lane, London, E.C.3). **Stand No. 79, Row E.**

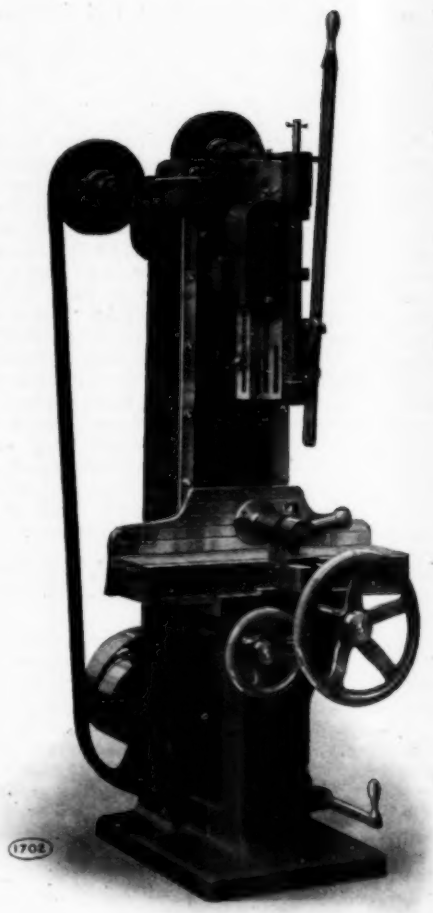
Rubber.—Rubber is a material that has hitherto been practically unknown to the average builder except as a floor covering. This stand is therefore likely to be something of a revelation to those in the trade. Not only are we shown its value as an insulator and damp-resister, but we are reminded that in its various forms rubber is durable, elastic, resilient, and abrasion-resisting. The display also shows that it has very considerable possibilities for artistic expression in decorative schemes. Chiefly, of course, the stand exhibits rubber flooring and tiling, but there are suggestions for many other applications of the material, while other uses will suggest themselves to architects and builders once they are brought to realise the properties of rubber and what can be done with it by modern processes.

The Ruberoid Co., Ltd. (Lincoln House, 296/302, High Holborn, London, W.C.1). **Stand No. 142, Row H.**

"Ruberoid" Materials, etc.—"Ruberoid" roofing has been employed for over 35 years on buildings of all types, and is equally efficient on flat pitched or curved roofs, and can be laid on wood or concrete. It is made in two colours—grey and red—which are permanent. In addition to the standard or smooth finish, "Ruberoid" is also made with a slate finish formed by rolling crushed natural slate into the surface during manufacture. The slate surfaced roofing is made in two unfading colours—red and green. The texture of the surface and the soft colourings make this an appropriate material for roofing bungalows, garages, pavilions, and all pleasure buildings. A new and attractive form of "Ruberoid" is the "strip slate," containing four slates in one, and being quickly fixed. Other specialities exhibited include dampcourse sarking and roofing felts, insulating papers and preservative paints.

J. Sagar and Co., Ltd. (Canal Works, Halifax, and 119-121, Finsbury-pavement, E.C.2). **Stand No. 1, Row A.**

Woodwork Machinery.—A fine display of woodworker's machinery is on view here—a feature being that all the machines are electrically driven, some being actually under power. Among those shown are :—The "Premier" combined hand and roller feed surface planing and thicknessing, moulding, etc., machine (AF), for planing out-of-twist, making glue joints, bevelling and chamfering, rebating, tonguing, grooving, moulding, etc.; chain-feed edging and sawing machine (ACF), for ripping and edging boards, etc., straight and true, at high feeding speeds; band sawing machine (NEA), for sawing straight or curved work; continuous feed automatic jointing machine (ACW), for making perfect joints, square or angle joints, tongue or groove joints, single or double, etc.; heavy double-geared roller feed planing and thicknessing machine (IU), which may be used for the heaviest and also the finest work in planing and thicknessing, framing, panels, boards, heavy timber, etc.; heavy vertical spindle moulding and shaping machine (ACP); double spindle re-



Chain-Cutting and Hollow-Chisel-Mortising Machine (A.C.O.).

cessing machine, for stair strings (ACJ); semi-automatic chain-cutter and hollow chisel mortising machine (ACO) (light type) (see above), and others. Every woodworker and cabinet maker should make a point of visiting "A.1."

Arthur Sanderson and Sons, Ltd. (52-55, Berners-street, London, W.1). **Stand No. 106, Row F.**

Wall Decoration.—This stand will attract as much attention as any at the Exhibition, for its appeal is universal. Messrs. Sanderson are amongst the pioneers of well-designed wallpapers to suit modern ideas on wall decoration, and display on the stand a selection of their products for various purposes and to suit different pockets. One would like to see, as a contrast, a few of the papers that were popular 30 or 40 years ago; it would be an object-lesson in the improvement of public taste, for which the firm has been so largely responsible. Of particular interest is a recess, 17 ft. wide, papered with a scenic decoration on which no repeat appears; we are told that no fewer than 300 blocks were used in its production. On this stand are also shown interesting ideas in panelling schemes. In addition to wallpapers, the firm handles paints, and a section of the stand is devoted to a particularly attractive display of "Santonia," "Durolave" water paint, and "Dersonite" enamel. No architect or builder, or member of the general public for that matter, should miss seeing this display, which contains many new suggestions that cannot fail to be helpful to all interested in tasteful decoration.

Scaffolding (Great Britain), Ltd. (Lansdowne-road, Stockwell, S.W.8). **Stands Nos. 52D and 61/66, Gallery.**

Tubular Scaffolding, etc.—Patent tubular scaffolding is now largely vying with timber scaffolding for important jobs. The base plates are placed in the desired positions with convenient lengths of tube for uprights. The clamps for the ledgers are then fixed to the upright by fixing the coupler band on

the vertical tube by means of thumb screws. The chair is then placed against the vertical tube and the horizontal tube lifted into position. The screw plate is placed in position behind the lugs on the coupler band, and the belt is then screwed as tightly as possible with the bar, or podger supplied. When bracing is required the braces are fixed to the standards or ledgers either by a patent angle coupler or the standard couplers. Patent putlogs can be obtained made of oak strengthened by a bar of steel which projects at one end. This steel projection fits into a joint of the brickwork, thus rendering it unnecessary to leave out bricks which afterwards require filling in. Examples of this work are shown on this stand and its advantages demonstrated. Also shown is patent suspended scaffolding. This type of scaffolding was first used in America, but is now marketed in this country in an improved form by Scaffolding (Great Britain), Ltd. Patent "Scaffixer" scaffold ties and patent "Conform" steel shuttering, designed for use with ordinary timber strutting or for use with tubular scaffolding as the means of support or alignment, complete a valuable exhibit.

Sika, Ltd. (82, VICTORIA-STREET, S.W.1). **Stand No. 309, Row T.**

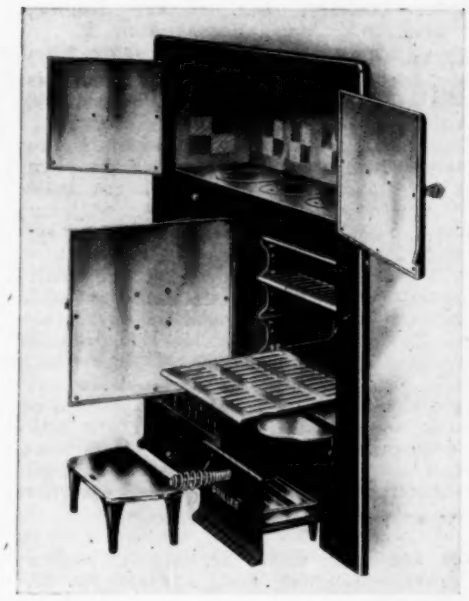
Structural Waterproofing.—On this stand is shown "Sika," a waterproofing material added in liquid form to ordinary Portland cement. It is applied in five varieties, each having their specific functions. No. 1 is a normal setting waterproofer for addition to concrete or rendering. It is indicated for use where water-pressure can be removed during operations. Nos. 2, 3, 4 and 4A, in addition to waterproofing cement, control its setting time. Ordinary Portland cement, we learn, can be made to set in a matter of seconds if required, and, by reason of this, leaks can be effectively sealed and surfaces rendered while the water is actually running through. Demonstrations of sealing jets and rendering running surfaces are given at the stand upon request. The company's representatives on the stand will advise or assist anybody interested in the protection of structures against wetness, dampness and corrosion.

The Silicate Paint Co., Ltd. (CHARLTON, LONDON, S.E.). **Stand No. 95, Row E.**

Decorative Paints.—This firm exhibit two rooms treated with "Duresco," showing how beautiful and pleasing effects may be obtained, at moderate cost, by well-chosen colours and simple decorations. The ceiling of the drawing-room is in "F" straw colour, the cornice in parti tint, the frieze is grounded with No. 515 magenta with conventional floral decorations. The wall panels are in No. 522 cornflower blue, the stiles and mouldings being French grey and No 72 cement "Duresco." The woodwork is in No. 1044 and No. 1062 "Slipaco." The ceiling and cornice of the smaller room, etc., are also treated with varieties of "Duresco." The panels shown inside were decorated some 30 years ago. An interesting feature of the exhibit is the display of decorative panels in "Duresco," being the winning panels executed this year.

Samuel Smith and Sons, Ltd. (BEEHIVE FOUNDRY, SMETHWICK). **Stand No. 214, Row L.**

Combination Ranges.—Shown here is the "Foresight" patent combination range. Features of these models are that no special pots or pans are required; the oven-door catch is simplicity itself, there are no springs or levers to get out of order; the oven shelves of the "Foresight" range are safe, and can be drawn out to the fullest extent for basting without the slightest danger of tilting forward or drawing out too far. In addition, the patent griller is simple to use. It is not necessary to go on the knees to open the griller, and the large non-heat-conducting handle can be held when the griller is scorching hot. The doors above the hob-plate apply to the "D"



THE "FORESIGHT" PATENT COMBINATION RANGE.

models only, and can be removed when not required. Those interested in fitting labour-saving appliances to houses will do well to inspect this stand carefully.

South Metropolitan Gas Co. (709, OLD KENT-ROAD, S.E.15). **Stand No. 319, Row V.**

Coke Fires and Fireplaces.—There is an admirable selection of "Metro" products on view at this stand. A speciality is made of coke burning grates for living-rooms. Coke as a fuel has many things in its favour. It is clean, easy to handle, produces a hot, glowing fire, and gives off no smoke to foul the outside air or soot to foul the chimney. The "Metro" coke fire is fitted with a special gas burner which overcomes the old-time difficulty of igniting the fuel. These grates are supplied in two types: (1) inset type for building into existing fireplaces, and (2) the independent type for standing in front of existing fireplaces. This stand is well worth the closest inspection from architects and builders.

Staines Kitchen Equipment Co., Ltd. (94, VICTORIA-STREET, WESTMINSTER). **Stand No. 211, Row L.**

Kitchen Equipment.—Kitchen engineers will find of interest the complete kitchens and service room installations for hotels, restaurants, canteens, etc., displayed here. The new "Splendid" crockery washer and the "Blakeslee" crockery washer—very highly efficient electrically driven crockery washers—are worthy of notice. They are claimed to give great saving in labour and breakages, to be easy to manipulate, and to have low running and upkeep costs. "Staines" patent greaseproof sink in teaks, and galvanised steel and plain teak sinks, wash-tubs, "Staines" patent household model teak greaseproof sinks for domestic washing-up, for all culinary or laundry purposes, are further on show. Other exhibits of interest are the "Peha" vegetable-cutting and shaping machine, gas and steam water boilers for tea, and coffee-making machines, up-to-date self-contained refrigerating plants, etc.; in short, everything for the kitchen.

The Standard Metal Window Co. (HEAD OFFICE: HOUGHTON-STREET, WEST BROMWICH, STAFFS. LONDON: 47, VICTORIA-STREET, WESTMINSTER, S.W.1). **Stand No. 271, Row R.**

Metal Fronts and Windows.—On this stand there is a comprehensive exhibit of all-steel shop fronts, also windows, casements, industrial windows showing all types of opening lights, a range of steel doors, inside steel partitioning, standard windows in wood frames, and leaded glazing in considerable variety. The stand is one that should appeal to all who desire to keep in touch with recent developments in metal fittings.

Stephens and Carter, Ltd. (PADDINGTON GREEN, W.2). **Stand No. 254, Row Q.**

Builders' Ladders.—An exhibition of builders' ladders, barrows, steps, trestles, trucks, extension ladders, scaffold cords, fall ropes, tarpaulins, wire lashes, sieves, cripples, drain rods, rubbish screens, handcarts, and other plant for the building trade is displayed in good array on this stand. Especially is attention drawn to the patent wire-wove rubbish basket, the handles of which cannot break away, nor the bottom fall out. This basket will easily outlast from four to six ordinary baskets, and the extra cost is only a matter of pence. A full-sized travelling cradle is shown working on continuous track. There is also an exhibit of improved tubular scaffolding, while other sundries and novelties of particular interest to builders and decorators will also be found on show.

Ten-Test Fibre Board Co. Stand No. 275, Row R.

Solid Fibre Board.—This exhibit demonstrates the decorative possibilities of "Ten-Test" from both artistic and practical points of view. Also illustrated are the possibilities of the material for outside work on bungalows, pavilions, garages, etc., and its usefulness as an insulator against both heat and sound. Other points which can be made are the strength of its adherence to concrete for poured work on walls and solid or hollow floors; its property of preventing condensation and its acoustic properties. This fibre board may easily be cut with a fine set saw and can be nailed over old plaster without trouble. It is easily decorated, may be papered and can, we learn, we used with cement and rough cast. For external use it is impervious to dry rot. Architects and contractors should make a point of visiting this stand.

Thames Board Mills, Ltd. (PURFLEET, ESSEX). **Stand No. 138, Row G.**

Fibre Wallboarding.—This architect-designed stand shows off to good advantage the attractiveness and usefulness of the "Essex" fibre wallboards. This forms a permanent and tasteful interior lining for walls. It adds warmth and its panelling possibilities are many. Paint or distemper may readily be applied without preliminary treatment, while an outstanding advantage of this board is that it cannot crack or fall, being unaffected by vibration. For ceilings or walls it provides an excellent alternative to lath and plaster, and its matt surface imparts a very pleasing finished effect. It is, in effect, a material whose possibilities should be investigated by all.

O'Brien, Thomas and Co. (17, UPPER THAMES-STREET, E.C.4). **Stand No. 238, Row O.**

Door Fittings.—This company is showing the "Coburn" system of folding, sliding and "slide-inside" door fittings, especially as applied to the garage door. This stand will prove of interest and value to architects who are designing garages, factories and all classes of buildings where sliding doors are advisable.

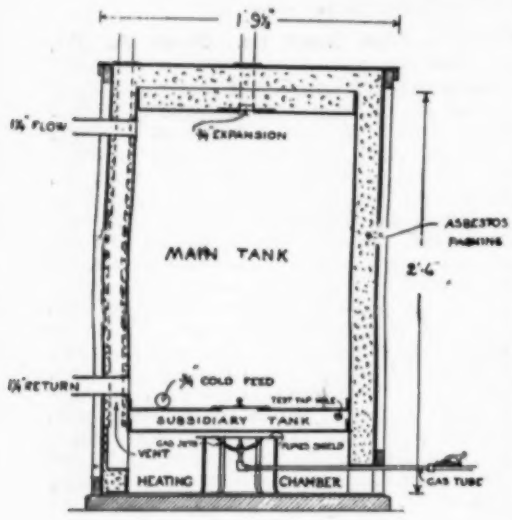
A. Thompson (27-29, ALBION-ROAD, ROTHERHAM). **Stand No. 60, Gallery.**

Artificial Marble.—This stand makes a special display of "Lustrite," a new material which can be used for the making of enamel tiles in solo or mottled colours, for the making of artificial marble. Synthetic marble in the richest colours and with the most beautiful combinations can be reproduced with equal facility. The polish is natural and the product can be used for outside as well as interior decorations. Already the material has been tried for indoors and outdoors constructional use, and under all sorts of climatic conditions, had given most satisfactory results. "Lustrite" opens out an entirely new field in the artificial marble industry and architects have in "Lustrite" a material which they can specify with, we learn, a certainty

of securing an effect equal to that of marble and which in cost is competitive with tiles. For use in hospitals, shops and dwelling-houses, for wall panels in bathrooms, staircases and kitchens, for bath and fireplace surrounds and hearths, it gives a splendid finish and a warm and beautiful effect.

E. Horace Thompson (High Pine Close, Weybridge). **Stand No. 220, Row M.**

Domestic Water Heater.—This heater, described as Thompson's patented "Nocondense" night and day water heater, is a simple device for either supplanting or supplementing an independent boiler or kitchen range boiler. A hot-water tank for an airing cupboard is encased with insulating material to conserve the heat. A suitable chamber is formed beneath for a few minute gas jets to be kept constantly burning, and a 1 in. exhaust is provided. The tanks may be connected by flow



SECTION

NOTE – OVERALL LENGTH OF BOTH HEATERS IS 2'6"
OVERALL HEIGHT 2'3" AND 2'9" RESPECTIVELY

Illustrating Messrs. E. H. Thompson's Exhibit.

and return pipes to the coke-heated boiler, when the gas can be used as supplementary only, or to take full burden in the summer months. The heater is also designed for use as the sole water heater in a small house. Sixty cubic feet of gas in 24 hours will supply two hot baths, as well as a good supply of hot water for domestic purposes. With gas at 3s. per thousand cubic feet, this will cost only 1s. 3d. per week. These heaters have been subject to many independent tests, both by gas companies and private users for 18 months, with, it is stated, most satisfactory results.

Triangular Construction Co., Ltd. (Imbercourt, East Molesey, Surrey). **Stand No. 8, Row B.**

Building Methods and Plant.—Well known as the inventors of the "Triangular" method of wall construction, in which hollow triangular-shaped concrete units are ingeniously used to form a weatherproof concrete wall which is not subject to condensation troubles on the inner face, this company is now interested in another novel form of walling which is of considerable interest. It takes the form of a piece of walling, built with the triangular shape units, but with an outer face of reconstructed Portland stone, showing how readily the system lends itself to excellent bonding and to the formation of pilasters, etc. By a special process a marble effect is obtained suitable for interior work, and the attractive result is well worth seeing. The stand also exhibits the firm's concrete tiles, mixers, tile machines, block machines, etc. Another new feature shows how triangular blocks may be used with steel reinforcement to form lintels.

Triplex Foundry, Ltd. (Great Bridge, Stafford). **Stand No. 11, Row B.**

Grates.—The popularity of the "Tripiex" grate, to be seen at work on this stand, is shown by the fact that no fewer than 44,000 have been sold and are now in use. The result of this large output is that the manufacturers have been able to reduce the price this year; and all the new models are fitted with a hearth oven for grilling or warming plates. The model on the stand is coupled to a 30-gallon cylinder, and two hot baths per hour are guaranteed. The strongly-built roasting oven, made in sections of cast-iron, is large enough for a large family. A feature of this workmanlike looking grate is the inclusion in the price of cast-iron flues, which, of course, reduces fixing costs. A larger model, known as the "G" pattern, is also on view, as also is the "C" type with an oven on each side of the fire. Those concerned with small working-class dwellings will be interested in the "Workwell" open-fire grates, also shown in operation.

Tuke and Bell, Ltd. (27, Lincoln's Inn Fields, London, W.C.2). **Stand No. 60, Row D.**

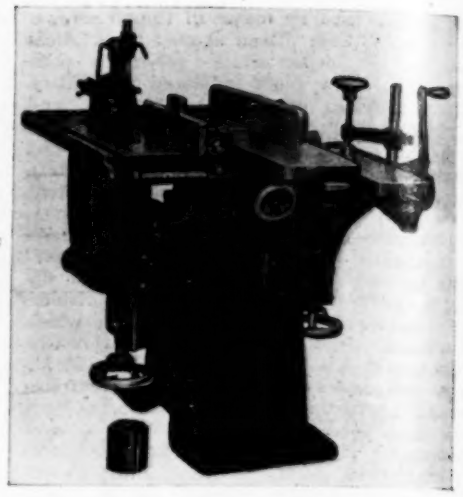
Sewage Disposal.—On this stand is exhibited a full range of sewerage and sewage purification apparatus, the central feature being an architectural model of a country house and grounds, showing the Tuke and Bell semi-septic system of sewage purification installed. In conjunction with such country house drainage are shown two special manhole covers. A special cast-iron interceptor trap is exhibited for use with sewage purification plants, together with a large cast-iron grease trap, which should always be used at country houses and institutions where a sewage purification scheme is in operation, and even for hotels and institutions where the drainage connects to a sewer. Other exhibits include the "Grip" road cover, the "Ideal" revolving distributor, a pneumatic ejector, a range of penstocks, disc valves, tidal flaps, handstops, and sludge plugs, and a pressure water filter of a size suitable for dealing with the water-consumption of a large country mansion or institution.

Turner Brothers Asbestos Co., Ltd. (Trafford Park, Manchester). **Stand No. 146, Row H.**

Asbestos Products.—This exhibit is a practical demonstration of the application of the products manufactured by the firm for roofing, walling, and interior decorations, including "Turners' Trafford Tiles," "Permanite" asbestos-cement slates and sheets, "Endurol" tiles, etc. An entirely new idea, recently introduced by this firm, is the "Serval" multiple tile, a boldly designed, readily fixed unit having the effect of pantiles of substantial thickness. These tiles are designed specially for the roofing of domestic dwellings. One of these tiles has the cover area and appearance of 16 ordinary sized pantiles, but needs only one operation instead of 16 to roof the same area. For interior decoration there are "Permanite" asbestos tiled sheets, which are easily erected and will last for years. They are supplied in sheets 48 in. by 48 in., and can be obtained in ivory, green, heather, light blue, lavender, grey, etc., in both plain tiled and dado tiled effects. Another interesting product is "Serval" asbestos felt, for use wherever sarking, roofing, or flooring felts are employed. It is made with a base of mineral asbestos, filled with mineral bitumen, and can be obtained in two grades, "standard weight" and "heavy weight." The felt is claimed to be impervious to the severest conditions of weather, and once laid lasts for years without attention.

S. Tyzack and Son, Ltd. (341-345, Old-street, E.C.1) **Stand No. 185, Row K.**

Woodworking Machinery.—This firm is making a special show of its "Super-Seven" universal woodworking machine, for which it is claimed it comprises seven machines in one, namely, 14 in. sawbench, 8 in. planing bench, boring machine, slot mortising



The "Super-Seven" Universal Woodworker.

machine, 4 in. thicknesser, spindle moulder, and, lastly, a tenoner. We understand that the "Super-Seven" is one of the latest and most advanced types of combination machine, and has the advantages of saving space, of high-speed output and initial low cost. The "Super-Seven" has four models. So that for the user who requires only two operations, the machine can be bought as a combined sawbench and planer only. Woodworkers should make a point of seeing this machine in action.

Venesta, Ltd. (1, Great Tower-street, London, E.C.3). **Stand No. 115, Row A.**

Plywood.—On the Continent, plywood seems to be used by architects for interior decoration to a much greater extent than here. This stand is a very convincing demonstration of the very wide range of colour schemes and effects possible with this material, and should be of interest to all architects who wish to keep up to date their knowledge of the progress of modern materials. The use of each grade of the firm's plywoods are practically demonstrated, the new metal-face plywood, known as "Plymax," being of particular interest. This firm has now adopted the policy of grading and branding its products so that architects and builders may be able to specify the grade of plywood best suited for their purpose, and the way in which this useful innovation is carried into effect is demonstrated on the stand.

Vigers, Sons and Co., Ltd. (59, Poland-street, W.1). **Stand No. 9, Gallery.**

Parquet Flooring.—On this stand are shown some beautiful parquet flooring—from the simple herring-bone designs to the more elaborate and beautiful patterns in deal, Oregon pine, pitch pine and Australian oak blocks. Those who contemplate specifying floorings for dance-halls, schools, public buildings or for ordinary domestic work will do well to visit this stand.

Vulcanite, Ltd. (Pelican Works, 96a, Peckham-road, S.E.15). Also at Belfast, Glasgow, Wigan and Newcastle-on-Tyne). **Stand No. 97, Row E.**

Roofing.—The patent "Vulcanite" roofing, a permanent waterproof covering for flat roofs of wood and concrete construction, also for lining tanks, basements, reservoirs, etc., is on show here. It is unaffected by vibration, settlement, expansion or contraction, and change of temperature. Models showing method of application of "Vulcanite" system to flat roofs are erected for inspection. Other roofings on exhibition are "Rexilite," "Ark" and "Pyramid" pure bitumen styles and "Leatherite" and "Apex" felts for roofing, sarking and lining. Dampcourses, among them "Reliance" lead and bitumen dampcourse, "Bituna" bitumen dampcourse on hessian base (two qualities), pure bitumen dampcourses on fibre base, namely, "Rexi-

lite," "Ark" and No. 3 Bitumen are also seen. "Vulcanite" sanded asphalt and carpet and linoleum underlays are other exhibits.

Wadkin and Co. (Green Lane-road, Leicester. London Office: 11, Queen Victoria-street, London, E.C.4). **Stand No. 164, Row J.**

Woodworking Machinery.—This exhibit consists of a selection of the firm's latest models of direct motor-driven, high-speed woodworking machinery, the whole of which is shown in operation. The exhibits include a cross cutting and trenching machine, an automatic cross-cutting machine, an 18-in. saw bench, with rise and fall table, an 18-in. canting spindle dimension saw, a 30-in. band sawing machine, a 6-in. hand-feed jointing machine, a 20 in. by 9 in. combined surfacing and thicknessing machine, a chain mortising machine, with hollow chisel attachment, a chain and hollow chisel mortising machine, a 24 in. by 6 in. tenoning machine, a universal open end belt sander, and a vertical spindle moulder. The exhibit well illustrates the variety of woodworking machines which is at the disposal of builders and contractors and the very numerous purposes which it serves.

Wm. Wadsworth and Sons, Ltd. (High-street, Bolton, Lancs). **Stand No. 243, Row P.**

Garage Lifts.—Shown here is the Patent Turn Lift, designed mainly with a view to garage work. The cars can be expeditiously handled, as, whatever the position of the car, there is no twisting, as the lift will deliver in any point of a circle on any number of floors—that is, the lift acts not only as an ordinary lift, but as a turntable on each floor. Wasted space around the lift is done away with, as cars can be left simply clear of the revolving lift enclosure. The exhibit is under working conditions, and interested parties will be able to see exactly what the lift will do, and the simplicity of it. Another exhibit is the new patent 2-speed lift for alternating current. Any speed can be attained, and any ratio of speeds between the highest and the lowest can be obtained.

Waygood-Otis, Ltd. (54-5, Fetter-lane, E.C.4). **Stand No. 112, Row F.**

Lifts.—Here is an exhibit to interest the architect and lift engineer. It is a working passenger lift, travelling from ground floor to gallery, operated by patent "Micro-drive" self-levelling machine, which automatically ensures level stopping at the floors in either direction, irrespective of load in the car. This type of lift has been installed in a great number of business houses, hospitals and garages throughout the world, and it is particularly helpful to the handling of goods, which are moved into lifts on trolleys. Other exhibits include models of an automatic electric passenger lift and a hand-power dinner lift. We understand that double worm tandem machines for operating escalators have been supplied by Messrs. Waygood-Otis to the Underground Electric Railway. Over 80 of these have already been supplied and fitted in 31 stations in London, and 13 are in hand. A specially designed internal geared machine is shown, suitable for goods lifts, being capable of raising heavy loads at slow speed with a minimum of current consumption. Several pieces of electrical controlling gear are also exhibited.

W. H. Willcox and Co., Ltd. (Southwark-street, S.E.1). **Stand No. 32, Gallery.**

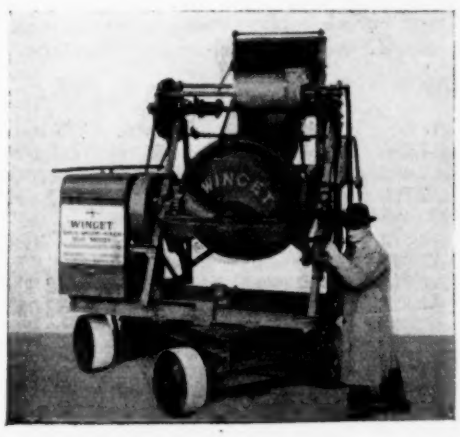
Sump Drainers.—Willcox's "Penberthy" automatic electric cellar and sump drainer on view here is a new type of the well-known "Penberthy" drainers which have been on the market for so many years. This new type, as its name denotes, is operated automatically by electricity, and is carefully designed to give real and lasting service. It operates only when water accumulates, causing the float to rise and make contact, and immediately ceases action when the water has been disposed of and float falls. This electric type is particularly suitable: (a) Where town water pressure is unavailable or at least very low; (b) Where excessive quantities of seepage water has to be handled; (c) Where discharge heads are up to 20 feet; (d) Where low cost of operation is an important factor. Other types of "Penberthy" automatic cellar and sump drainers complete a most valuable display.

The Wilfley Co., Ltd. (Salisbury House, London Wall, E.C.2). **Stand No. 261, Row Q.**

Jointless Flooring, etc.—Specimens of the various types of flooring in which this firm specialise are here shown, prominent among them being "Marbolith" jointless flooring, which makes an excellent covering for worn wooden floors, uneven stoneflags, and cold and dusty concrete. All these can be transformed into smooth sanitary, warm, quiet, modern floors with minimum inconvenience and at moderate costs. Besides the usual plain colours, "Marbolith" is shown in variegated patterns, giving artistic effects that will tone with any decorative schemes. In addition, the firm show floors in different varieties of wood blocks and parquetry, in various patterns.

Winget (1924), Ltd. (Winget House, Grosvenor-gardens, S.W.1). **Stands Nos. 232, Row N, and 234, Row O.**

Open Drum Mixers.—Recent developments of concrete construction, particularly the scientific advances made in mechanical concrete mixing, will be fully demonstrated on this stand. The "Winget" open drum mixer with the Burn-Lancaster drum will be represented by a selection ranging from the hand-operated, 5/3½ type, with its output of 15



The "Winget" 10/7 "Turntable" Mixer.

to 20 cu. yds. per day, to the 14/10 model, complete with elevating hopper and automatic water tank, and maintaining an output of 120-150 cu. yds. per day. Two of these mixers will be shown equipped with the "Winget" hoist, which has proved an invaluable feature in *in situ* concrete work. The latest, perhaps the finest model of all, is the new 10/7 "Turntable" mixer—a machine which works in three positions by a simple turn of a lever. A new model will also be shown of the "chain-spade" mixer, specially designed for asphalt mixing, as well as for producing the semi-wet concrete necessary for the manufacture of concrete blocks and slabs for building purposes. In addition to mixers, Messrs. Winget are exhibiting various types of their concrete block and slab-making machines, including the No. 2A pressure machine, the popular hand-power press which has been used in housing schemes in all parts of the country. Other "Winget" machines for tile, kerb and brick making complete an interesting exhibit.

Henry Wynmalen and Co., Ltd. (Westminster, S.W.1). **Stand 318. Row V.**

Tiles.—Flemish tiles of attractive appearance find space on this stand. Among them are roofing tiles (as sole importers), the types being Honnechy-du Nord and Honnechy-Boulet, Honnechy-Beauvais and Honnechy-Burgundy, Harskirch-Mulden and Charentes-Marseilles. Bricks are also shown in various colours, types, sizes and facings, among them "Tiglia" hand-made rustic bricks and "Wynmalen" hand-made multi-coloured bricks. Floor tiles include Honnechy red floor quarries and Tiglia red, blue and yellow floor quarries, while wall tiles are of the Tiglia multi-coloured rustic sand-faced glazed style.

Young and Son, Ltd. (Africa House, Kingsway, W.C.2). **Stand No. 255, Row Q.**

Cement and Materials.—Associated with Messrs. Young & Son, Ltd., are the Dunstable Portland Cement Co., Ltd., and Smeed, Dean and Co., Ltd., and so this stand at Olympia is exhibiting products of all three. Messrs. Young's exhibits include Dunstable "Rapard" cement and Smeed, Dean's "SD" and "Supercrete" brands. Test figures are exhibited showing the high qualities of these cement productions and a testing machine on the stand enables these qualities to be demonstrated. Various qualities of stock and red-facing bricks, slates and tiles are also shown.

The Yorkshire Copper Works, Ltd. (Leeds, England, and 53, New Broad-street, London, E.C.2). **Stand No. 270, Row R.**

Copper Tubes.—"Yorkshire" copper housing tubes are produced in a special finish which makes them particularly suitable for use with all types of compression joints. They can be bent, drifted and flanged without annealing, thus ensuring a quick, reliable job with minimum labour costs. All tubes are made from new metal and rigidly tested and inspected to 1,000 lb. per sq. in. water-pressure before despatch. No preparation is required, and tubes are supplied ready for easy bending, drifting, flanging without annealing. The tubes are shown in standard sections for hot and cold water service pipes, and demonstrations are given showing the ease and facility with which they can be bent, drifted, etc.

The following meetings have been arranged to take place at the Exhibition next week:—

Saturday, April 14.—Association of Architects, Surveyors and Technical Assistants.

Monday, April 16.—Society of Estate Clerks of Works. Visit of Lord Mayor, Lady Mayoress, and Sheriffs.

Tuesday, April 17.—Worshipful Company of Tylers' and Bricklayers' Dinner.

Wednesday, April 18.—National Federation of Clay Industries.

Thursday, April 19.—Institution of Sanitary Engineers. Architecture Club Dinner.

Friday, April 20.—London Master Builders' Association.

Surrey Quantity Surveyors.

At a meeting held at the Surveyors' Institution on March 26, a paper was read by Mr. S. T. Sunders, P.A.S.I., on the "Origin and History of Quantity Surveying." The chair was taken by Mr. W. L. Evershed, F.S.I., who was supported by several members of council and members of the Quantity Surveyors' Committee of the Surveyors' Institution, including Mr. A. G. Cross (member of council), Mr. J. M. Theobald (member of council), Mr. Christopher Chart (member of council) and Mr. R. B. Mann. The meeting was well attended, and an interesting discussion followed. Old books and documents relating to quantity surveying were on view. The fact that at one time measurers were known as "ordained surveyors" was brought to light, and the particulars regarding "measuring feasts" at the conclusion of a job caused much amusement. Quantity surveyors practising or residing in the county of Surrey who would like to receive notices of meetings are invited to write the hon. secretary (Mr. Henry A. Mackmin, F.S.I., "Glenlynn," Beulah Road East, Thornton Heath, Surrey).

WEEK IN PARLIAMENT

Westminster, Wednesday.

The Town Planning Act of 1925.

Mr. Buxton asked the Minister of Health if he would give the number of cases in which betterment had been recovered under Section 10 of the Town Planning (Consolidation) Act, 1925, and the total of the amounts so recovered?

Sir K. Wood, who replied, said that claims for compensation and betterment under the Town Planning Act, 1925, were not required to be reported to the Minister, and he had knowledge of only one claim for betterment, resulting in the recovery of £1,500. The right to claim betterment had been chiefly used in meeting possible claims for compensation, which, so far as his information went, had been few.

Scottish Housing.

Sir J. Gilmour informed Sir G. Collins that during the period from July 1, 1926, to February 28, 1928, the number of houses approved for State subsidy was 5,768 under the Housing, etc., Act, 1923, and 20,609 under the Housing (Financial Provisions) Act, 1924. The estimated capital value of the subsidies in each case was £434,000 and £3,230,000 respectively. In addition to the above, 3,479 houses were approved under slum clearance schemes during the above period. The subsidy payable in respect of those houses was 50 per cent. of the approved annual loss and was not yet ascertainable.

Unemployed Building Trade Operatives.

Mr. Betterton informed Mr. Wellock that the following table gave an occupational analysis of the numbers of persons in Great Britain classified as belonging to the building trade recorded as unemployed at February 20, 1928, and February 21, 1927, respectively :—

Occupations.	February 20, 1928. Wholly unemployed.	Temporarily stopped.	Total	February 21, 1927. Wholly unemployed.	Temporarily stopped.	Total.
Carpenters	14,139	437	14,576	8,209	399	8,608
Bricklayers	7,102	296	7,400	2,949	196	3,145
Masons	2,531	234	2,765	1,911	180	2,091
Slaters	444	24	468	275	26	301
Plasterers	3,738	132	3,870	823	37	860
Painters	22,440	507	22,947	23,643	536	24,179
Plumbers	2,597	122	2,719	2,679	130	2,809
Labourers to above...	36,722	1,153	37,875	31,020	1,027	32,047
All other occupations	25,533	840	26,373	22,064	864	22,928
Totals ...	115,246	3,747	118,993	93,573	3,395	96,968

Repairs to the Houses of Parliament.

Viscount Sandon asked the Under Secretary of State for the Home Department, as representing the First Commissioner of Works, if he would state why no provision was made in the Estimates for work on the structural alterations of the Houses of Parliament; when this would be started; and whether he was satisfied that delay would not cause further deterioration and ultimately create expense.

Sir V. Henderson said that a sum of £10,000 was inserted in the Estimates under Class VII, Vote (3), Subhead B4. The First Commissioner hoped to be able to commence the repairs during the autumn recess. Meanwhile, he was satisfied that any delay in starting the work would not involve additional expense.

Rural Housing.

Sir K. Wood informed Sir A. Holbrook that up to the end of December last applications had been received by local authorities for assistance under the Housing (Rural Workers) Act, 1926, in respect of 599 dwellings. At the same date assistance had been promised in respect of 151 dwellings, and work was in progress on 89 dwellings. There were four counties (Isle of Ely, Soke of Peterborough, Merioneth and Radnor) for which no schemes had yet been submitted under the Act in question, and in which none of the district councils had been declared authorities. The number of houses completed in agricultural parishes in England and Wales under the Housing (Financial Provisions) Act, 1924, up to March 1, 1928, was 10,090.

Sir K. Wood informed Mr. Smith-Carrington that the numbers of houses erected in agricultural parishes under the Act of 1924 prior to October 1, 1927, were 8,077 by local authorities and 515 by private enterprise. The numbers erected since October 1, 1927, up to March 1, 1928, were 1,115 by local authorities and 27 by private enterprise.

Col. Crookshank moved: "That this House is of opinion that, in the interests of agriculture and the nation at large, every effort should be made to improve and increase the housing accommodation of the workers in rural districts." He said that in England and Wales, up to March, 1928, 168,951 houses were completed in rural districts since the war under the various Housing Acts, and up to September 30, 1927, 168,877 were completed by private enterprise, giving a total of 277,828. But he submitted that that Act required stimulating, because of the immense benefit to agriculture and in order to improve the conditions of the worker. Also, it would preserve the amenity and picturesqueness of our cottages—the half-timbered cottages of the Midlands and the South, the Cotswold stone houses, and the yellow stone cottages of Northamptonshire. The Act enabled the old buildings to be improved according to modern ideas without impairing the beauty of the English landscape.

In the debate which followed, many members supported the motion. Mr. Greenwood, a Labour member, however, contended that the Act had been an utter fiasco. There would be no large amount of building in rural areas unless assistance was given out of public funds.

Sir K. Wood, Parliamentary Secretary to the Ministry of Health, said that the problem of housing in rural districts was a very difficult one, and was entirely different from that presented in urban areas. The shortage of housing accommodation in rural areas was not, as it was in the urban areas, a legacy of the war. For decades before the war there had been a stagnation of house-building for rural workers. Complaints had been made with regard to the reduction of the subsidy, but in the twelve months since the announcement of the reduction, the prices of non-parlour houses included in the contracts let by rural district councils had fallen by some £60 a house. Surely, that was a step in the right direction. It had been said that the rate of building had fallen since the reduction of the subsidy, but what had happened was that in the months immediately before the subsidy was cut down there was a great rush by builders to obtain the full subsidy, and in the actual month before the subsidy was cut the number of houses built was as many as had been built, very often, in a period of twelve months before the war. It would be unfair to say, when a great effort of that kind was made, that they were not continuing to build at that particular rate. So far as rural housing was concerned, complaint could not be made as to the operation of the Wheatley Act. As at present advised, the Minister had no intention other than to see that Act operate, and he hoped that any houses that could be built under that Act would be built.

Out of 1,665,000 houses built in England and Wales since the Armistice, 278,000, or about 26 per cent., had been completed in the rural districts, and some 108,000 of those had been built without any State assistance. Very useful work had also been done by the rural councils, particularly in co-operation with owners. The latest figures were for 1926, and they showed that 147,870 houses were inspected. Of that number, 3,021 were found to be unfit for human habitation, and 31,452 were found not to be reasonably fit. In consequence of informal action by the rural councils, 29,013 of those houses were made fit by agreement with the owners, and that was a considerable step in meeting the housing situation in rural districts. The number of houses rendered fit in consequence of action under statutory powers was 17,298. The Housing (Rural Workers) Act was supplementary to the effort to erect new houses, and provided a liberal subsidy for the reconditioning of old houses. They were hoping for some improvement in that connection. More progress could be attained under that Act if more publicity were given to it. But the scheme must be given a longer time to run before they could come to any question of altering it. The number of counties which had submitted schemes was 45, and the number which had not submitted schemes was 16. In the case of 13 of these counties some or all of the district councils had been declared authorities under the Act. The schemes submitted by the lesser authorities were:—Non-county boroughs, 12; urban districts, 17; rural districts, 102; total 132. He still hoped that progress would be made under the Act.

He was glad that the Council for the Preservation of Rural England had taken action in the preservation of the best features of our country scenery, and the Ministry of Health would do all they could to assist the work. He did not desire to see, in connection with any housing efforts, the amenities of the countryside destroyed or disfigured.

Mr. T. Williams, a Labour member, moved an amendment to add to the motion the words "and in particular to encourage local authorities to make such provision as will free agricultural labourers from the tyranny of the tied-house system." This was rejected by 165 votes to 77, and the motion was then agreed to.

Unemployed in London.

Mr. Betterton informed Mr. Stephen that the following were the numbers of insured workpeople in the area of Greater London classified as belonging to the building trade and recorded as unemployed:—

Occupation.	Feb. 20, 1928.	Feb. 21, 1927.
Carpenters ...	1,282	1,012
Bricklayers ...	412	386
Masons ...	105	122
Slaters ...	81	55
Plasterers ...	330	142
Painters ...	5,845	7,545
Plumbers ...	348	482
Labourers to above	6,101	7,360
Other occupations	4,478	4,235
Total	18,992	21,339

The Salt Tower.

Mr. Day asked what precautions were being taken to prevent the further displacements and movements of the quay wall and the Salt Tower of the Tower of London; and whether it had now been found necessary to fit crack micrometers.

Sir V. Henderson said that cracks in the quay wall and in various towers had been under observation since 1913, and since that date the National Physical Laboratory had taken readings of the movements by means of micrometers. The movements discovered were of very small dimensions, and there was, at the present time, no cause for alarm.

LEGAL QUESTIONS WE HAVE BEEN ASKED

By W. T. CRESWELL, Barrister-at-Law, L.R.I.B.A., Associate (late Fellow) Surveyors' Institution, etc.

XV.—WHO IS THE OWNER OF MATERIALS, PLANT, ETC., ON THE SITE UNDER A BUILDING CONTRACT?

BECAUSE of some dispute arising between the employer and the contractor about a building contract, the ownership of materials and plant already on the site may become a serious question calling for special consideration.

Detinue.

If an employer wrongfully detains the property of the contractor or fails to deliver up any item thereof when demanded, he is liable in an action for "detinue" at the suit of the contractor.

Trover.

In some circumstances, an employer may have wrongfully appropriated items of the contractor's property to his own use; or wrongfully deprived the contractor of the use and possession of them permanently or for a substantial time; or he may have depreciated the value of, or destroyed, the goods by changing their nature or quality in allowing them to be subject to the weather and subsequent decay. Such acts amount to "conversion," for which an action for "trover" will lie at the suit of the contractor.

Materials.

If a contractor once fixes materials to the soil of the employer, he thereby forfeits his ownership of them; nor can he reclaim ownership of them if at any time subsequently the employer severs them again from the soil, and, therefore, an action for trover will not lie in these circumstances. But until such times as they are definitely fixed to the soil (apart from any overruling terms there may be in the contract), they remain the property of the contractor, and an action for trover will lie.

If, under the terms of the contract, the materials are to be paid for on delivery, or under a certificate of the architect, the property in them passes as soon as payment has been made, or the conditions as to the certificate have been fulfilled.

Plant, etc.

The plant of the contractor comprises all the items used for the purpose of his trade; and generally the contract provides for its removal by him on, or before, the completion of the work. If there is no such condition, then it is a question of fact to be determined whether the intention of the parties to the contract was that such plant, etc., was to remain part of the soil and the property of the owner; or, again, if it can be removed without injury to the employer's property, or whether (as is usual) there is an implication that the contractor is to remove it at completion, without leaving any damage to the owner's property.

If, for any reason, the works under the contract are wrongfully suspended by the employer, the contractor may recover for indirect loss due to his plant, etc., being kept idle; so, too, if there is no provision in the contract permitting the employer to take over the materials, plant, etc., then, on failure of the contractor to complete the work, or on his bankruptcy, the employer would appear to have no implied lien on unfixed material and plant; and, if there is provision made, and forfeiture is wrongfully applied to the materials and plant, etc., then the contractor is entitled to claim for any use that has been made of such property of his by the employer.

The Test.

The true test of property in materials and plant is whether the employer had, or acquired, an equitable right to them at the date at which the contract was entered into, and whether that right was for use of them for the purposes of the work only; a right intended to continue after its completion.

What is Provided in the New Form of Contract.

Under the proposed new National Form of Building Contract, it is provided that any unfixed materials which have been taken into account in a certificate, and for which the contractor has received payment, and which were intended for the works, become the property of the employer; but in the event of determination of the contract by the contractor, the latter has a lien upon all unfixed materials intended for the works (which shall then have become the property of the employer under the contract) until all moneys due from the employer are paid to him.

ARCHITECTS' & BUILDERS' INQUIRY BUREAU

We are glad to give questions and answers, but cannot accept responsibility for contributed replies, especially on legal matters.

***May we appeal to our correspondents to submit their queries on paper of a size easily filed, and written as legibly as possible, or, better still, in typewriting?*—ED.**

Limewash.

[REPLY TO T. A W. CARLISLE, MARCH 30.]

SIR,—I have found that the best binding material for limewash is a small proportion of coal tar, say, about a small half-pint to a bucket. Russian tallow is more generally used, and is fairly satisfactory, but I have found the above by far the best. FIXIT.

SIR,—The formula mentioned is an obsolete one and is not now used. I think the amount of Russian tallow was from ½ to 1lb. to each gallon of limewash. The copperas was doubtless added to give the requisite colour. The proper proportion can only be ascertained by experimenting. The lime and tallow were placed in a large tub and then slaked by adding water, and the mass stirred with a pole and well incorporated.

The following makes a good permanent wash: Half a bushel of lime slaked with boiling water; strain through a fine sieve, add a pinch of clean salt (dissolved before adding), add 3 lbs. of rice ground to a thin paste, and stirred in whilst boiling hot, ½ lb. powdered Spanish whiting, and 1 lb. clean glue previously dissolved in the usual way; add 5 gallons of hot water to this mixture, and let it stand a few days. Apply hot from a kettle kept hot over a portable furnace.

Another method.—To each ½ bushel of lime add 2 lbs. of sulphate of zinc and 1 lb. of salt. Its durability, especially for outside work, may be increased by mixing 1 pint of linseed oil (in lieu of Russian tallow) with each 2 gallons of limewash.

Any colour can be obtained by tinting with permanent powder colourings.

FRANK JAY.

Cleaning Monument.

SIR,—If the monument is in white or grey stone, use a hot and strong solution of soda and soft soap; brush well with a scrubbing brush. If in statuary marble, mix 2 ozs. of carbonate of soda into one quart of cold water, brush the marble with a clean brush dipped in this solution, rinsing constantly with clean water.

FRANK JAY.

SIR,—The steam scrubber probably does as little damage to the face of stonework as any other process. Generally speaking, the passion for cleaning up is unnecessary, and it is far better for all masonry to retain its natural weather face, unless for any reason it is already losing it. WEATHER.

Pozzolana.

[REPLY TO "WEATHERING," APRIL 6.]

SIR,—The value of the addition of pozzolanas or trass to lime or cement mortars, concrete, etc., has of late years been overlooked, although just recently it has been discovered that work containing these admixtures is far superior to those without it. The modern idea is to use more cement. This is a great mistake. To overload a mortar or concrete with cement is bad practice, and tends to reduce the sale of cement than increase it. Most text-books and authorities on limes, cement, concrete, mortars, etc., mention the early use and advantages of pozzolanas, trass, etc., by the Roman builders, and this is as far as they go. From the use of these admixtures the writer has found Rhenish trass to give the best results. This is a natural volcanic tuffstone, which contains all the best silicious properties of pozzolana.

The chief action of trass is that it enters into chemical combination with the free lime in the cement mortar, concrete, etc., forming an insoluble compound, so that the surface of the mortar or concrete is not weakened by the formation of crazing or the leaching out of the lime hydrate. This efflorescence is stopped by the addition of trass. The extra cost is very little, considering the damage efflorescence does to the surface texture of concrete, brickwork, etc., besides rendering the work most unsightly. Trass certainly assists greatly in stopping water travel in concrete, mortars, etc., and thereby checks efflorescence, discolouration, and surface decay.

C. A. LONGLEY, M.I.Struct.E.

Adzing.

[REPLY TO "RESTORER," MARCH 30.]

SIR,—The best operatives of the adze will be found in the nearest shipwright's yard. The use of this tool in ordinary carpentry has long fallen into disuse, and now it is being revived, purely for the sake of appearance, it is natural that the effect should be a little overdone and unnatural. JOINERY.

Aerated Cement for Fixing Tiles.

[REPLY TO "CRESCENTIA," MARCH 23.]

SIR,—I am enclosing herewith a letter to your correspondent, giving the information he desires. EXPERIMENT.

Cleaning Stone.

[REPLY TO "BANK," APRIL 6.]

SIR,—If your correspondent will kindly refer to my reply to "Ross" above, the same applies to his inquiry. WEATHER.

Duration of Engagement.

[REPLY TO "CORRESPONDENT," APRIL 6.]

SIR,—If, when the contract of service was entered into, no time was mentioned, and no express or implied agreement can be set up therefrom as to the duration of the service, then it is without doubt "a usual weekly engagement."

There is no rule or custom that the engagement of a clerk of works at a weekly salary constitutes an agreement for the whole term of the job; though it is often possible, as a consideration of the negotiations between, and the conduct of the parties, to set up such an agreement by implication. LAW.

THE BUILDING TRADE

EVERYDAY SCIENCE FOR ARCHITECTS AND BUILDERS—XIV

By A. M. Giles, B.Sc., A.I.Struct.E., A.M.I.E.E.
Diagrams and Illustrations by M. R. Dumville.

Transference of Heat.

It is quite impossible to bring within the limits of a few articles the numerous applications of the principles of heat in everyday life. So far the aim has been to give a brief account of those of outstanding importance, and, as a finish to the section dealing with heat, we must say a little about the methods by which the movements of heat are controlled. This, really, is the problem of the heating engineer, yet there is no reason why every one of us should not be able to deal with it as occasion arises. The methods by which heat is transferred from place to place are included in the three terms (*a*) conduction, (*b*) convection, (*c*) radiation. Briefly, these terms are defined as follows:—

By conduction of heat it is understood that the heat is passed on, or handed on, from particle to particle of a continuous material body from a point at a high temperature to one at a lower temperature, *e.g.*, a poker that is placed in the fire soon has its handle quite hot by the heat that is conducted along it from the part that is inside the fire.

By convection the heated particles of a material medium actually move from place to place and carry heat with them, *e.g.*, as has already been mentioned in a previous article, warmed particles of air or water themselves move (usually in an upward direction, unless, of course, otherwise directed) and set up "convection currents."

For radiation of heat a material medium is not necessary, since heat is emitted or radiated from a heat source in all directions by a series of transverse waves in the "ether" which pervades all space, *e.g.*, if it were possible to remove all the air from a room there would still be left what scientists call ether, and radiant heat travels through this ether by wave-motion somewhat like the ripples that travel over the surface of still water into which a

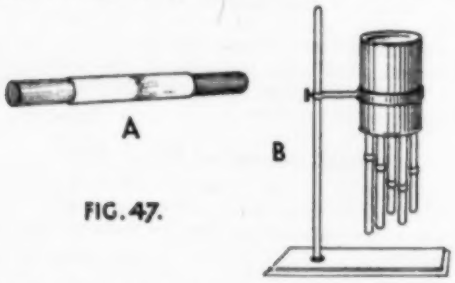


FIG. 47.

pebble has been thrown. It differs from the waves on the water surface in that it travels in all directions in ever-widening spheres, *i.e.*, it is radiated. Further, we may add here that these radiant heat waves travel through the ether just like light waves and wireless waves, and at the enormous speed of 186,000 miles per second.

Conduction.

Most substances conduct heat to a greater or less extent. Those, like metals, which conduct heat freely are called good conductors, while those like wood, glass, wool, etc., which conduct heat badly are called bad conductors or heat insulators. Both classes are useful in building operations. Before enumerating some of the applications, let us first describe two or three standard experiments which demonstrate the facility, or otherwise, by which heat is conducted along a body.

1. Two cylindrical rods of wood and brass and of the same diameters are placed end to end, and a piece of paper is wrapped tightly round the junction (see Fig. 47A). The apparatus is then held over the flame of a bunsen burner, or a spirit lamp, or a flame which is not a smoky one, when it will be noticed that on one side of a distinctly marked ring the paper will be scorched. From this we conclude that the metal conducts the heat away from the paper sufficiently quickly to prevent it from being scorched, while the wood, being a non-conductor, is not able to do so.

2. Fig. 47B illustrates one form of a piece of apparatus which demonstrates Ingenhouz' experiment. It consists of a metal cylindrical can into which boiling water can be poured. Fastened through the bottom of the can is a series of rods of different substances, such as brass, iron, zinc, wood, glass, etc. Around each rod a small heavy ring fits loosely. Before the hot water is poured into the can, the rods are coated with paraffin wax by being allowed to cool after having been dipped in melted wax. The rings are held at the top of the rods by the coating of wax. When the hot water is poured into the can the wax is melted by the heat which is conducted along the rods, and this allows the rings to slide down. The rod down which the ring slides the farthest is naturally the best heat conductor.

3. Forbes' Bar experiment. The illustration, Fig. 48, is purely diagrammatic and suggestive. The apparatus really consists of an iron bowl containing solder, which is placed over a gas ring. Dipping into the solder are the ends of two different metal bars, which will therefore be at a common temperature, *viz.*, that of the molten solder. In the actual experiment copper and iron are the two metals used. At equal distances along each bar is a series of small holes which contain oil or mercury, and in which the bulb of a thermometer is placed.

Between the metal pot and the first thermometer on each side is fixed a sheet of asbestos (not shown in the diagram) so as to ensure that heat reaches the thermometers along the bar by conduction only. After a short time the thermometers reach a steady state when it will be found that the readings are gradually less as you pass from the thermometer nearest the pot to the one at the extreme end. Those in the copper bar will read higher than those in the iron, from which it is concluded that copper is a better conductor than iron. From this experiment it is possible to determine the actual conductivity of the metals, for each substance has its own conductivity (lists of which will be found in most books of tables, in the same way that it has its own specific heat and specific gravity.

The conductivity of a substance—a brick wall, for instance—depends upon:

(*a*) The cross-sectional area through which the heat passes, or is conducted.

(*b*) The distance the heat has to travel between two cross-sectional areas.

(*c*) The quantity of heat that passes from one section to the other.

(*d*) The time taken for the heat to pass from one section to the other.

And, finally, (*e*) the temperature difference between the two sections.

Applications.

Since the heat conductivities of a large number of substances have been carefully determined and tabulated, we are able to control, in no small degree, the transference of heat. Radiators are made of metal, so that the heat from the hot water or the steam is easily and quickly conducted into the room. In the transference of the heat from the supply to the place where it is required there should be lost as little heat as possible. The pipes are therefore "lagged," *i.e.*, they are wrapped round with a good non-heat-conducting material. Similarly, of course, to prevent pipes from being burst, it is advisable to "lag" them with wool, paper, or straw, or any other good non-conducting material.

Much heat is lost from a room owing to the conductivity of the walls. In the winter time we want to keep the heat in the room, and in the summer time we want to keep it out, and a great deal of research work is being done in order to discover a cheap but efficient method of reducing the heat conductivity of the walls of our rooms and houses.

Paper is a good non-conductor, or, at any rate, a bad conductor. Everyone knows that a piece of ice wrapped up in brown paper, or ice-cream in cardboard boxes, can be kept quite a long time before melting. Cold storage chambers and vans are surrounded by some non-conducting material to keep the heat out.

The "fur" or "scale" that forms inside pipes or boilers is a bad conductor of heat. In the case of hot-water pipes this may be both good and bad. It depends upon which way you want it. In the one case, it helps to prevent the heat being lost from the pipes, where it is not wanted, while, on the

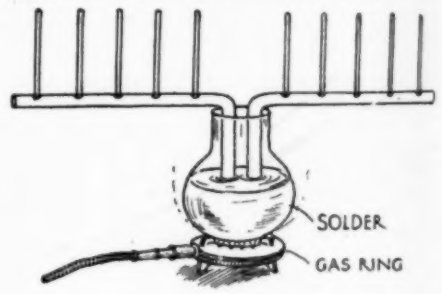


FIG. 48.

other hand, it tends to keep the heat from escaping where it is wanted. In the case of boilers, one might say that it is worse than useless, since it prevents the heat from being conducted to the water, and thus increases the time and fuel required to boil it. The water in a badly "furred" kettle takes longer to boil than it would in one from which the "fur" has been removed, or in which it has not been allowed to form.

Experiment.

Gradually lower a piece of wire gauze, so as to press down the flame of a candle or a bunsen burner. As it is lowered, a point will be reached at which the wire gauze will conduct the heat away from the flame sufficiently quickly to extinguish it. Next turn on the gas without lighting it, and hold the wire gauze so that the gas can pass through it. Now apply a lighted match to the gas above the gauze, when it will light and continue to burn above, but will not be lighted below the gauze—*i.e.*, between the gauze and the gas-jet.

One important application of this is found in the construction of the Davy safety lamp, much used by miners. The flame is surrounded by glass and wire gauze, so that the explosive gases can only get at it by passing through the gauze. These gases will burn inside the gauze, which conducts the heat away quickly enough to prevent the gases outside from reaching ignition temperature.

PLUMBING TRADES NATIONAL APPRENTICESHIP COUNCIL

A MEETING of this Council was held at the Central Technical College, Birmingham, on March 14. There were present Mr. Ernest Lesser (in the chair), Messrs. H. Blackman (vice Mr. Thacker, who was ill), Hugh Davies, W. S. Butterworth, F. Hoey, T. McKenna, J. Pickford, W. H. Smeaton, Dr. W. E. Sumpner, and the hon. secretary, Dr. R. S. Clay. Arising out of the minutes, the Chairman confirmed his previous statement that an apprentice could be legally bound to a corporation.

It was unanimously resolved that a letter of congratulation be sent to Mr. Smyth, of the Operative Plumbers' Association, on his new appointment to the secretariat of the Trade Union Council. A letter from Mr. Macdonald was read, notifying that the National Joint Industrial Council for the Plumbing Trade had passed a resolution refusing to recognise improvers in the plumbing industry, in view of the fact that a proper apprenticeship scheme had now been set up.

Arising out of the unexpected action of the Ministry of Labour in declining any longer to recognise Mr. Lesser as their representative on the Council, it was finally resolved, after some discussion, on the motion of Dr. Clay, that the following subclause be added to clause 2 (page 4) of the scheme:—

"(D) such other persons as are likely to be of service to the movement, not exceeding three in number, as may be annually co-opted by the foregoing appointed members." Arising out of this alteration, Mr. Smeaton gave notice that at the next meeting he would move that Mr. Lesser be co-opted under the new sub-clause. Reports were laid before the meeting regarding the progress of the scheme in S.E. Lancashire, St. Helens, Southport, Leeds, Manchester area, and the N.E. Coast. The position at Hull, Leicester, and Sheffield was also reported and discussed.

The hon. secretary gave a full report of the proceedings on the occasion of the deputation to the Board of Education when they had asked that one examination prior to the present minor examination should be reinstated as an optional examination, to be taken by such schools or education authorities as might desire to do so. The deputation had been fully representative of all bodies connected with the plumbing trade, and the case for the change had been clearly expounded by Dr. Clay and other speakers

Mr. Davies, the Board's Secretary for Technical Education, had stated at the end of the discussion that no definite reply to the petition of the deputation could be given, pending the receipt of the report from the Duchess of Atholl's Committee, which was then considering the general question of examinations in technical schools, and also the conclusion of an inquiry then being conducted by officers of the Board into the methods now obtaining for the teaching of plumbing throughout the country. It was hoped to receive both these reports in the course of the summer.

A further discussion took place on the problems involved in the apprenticeship of lads to their fathers. Mr. Blackman stated that both employers and operatives were agreed that it was desirable for some definite record to be made of such unindentured apprenticeships, as some record might be necessary for production in later life. It was finally agreed that Mr. Blackman should bring forward at the next meeting of the Council some definite proposal regarding the procedure to be adopted in such cases. The question of the best method to be adopted for securing the transfer of an apprentice from one employer to another was also discussed. It was pointed out that such a transfer might be desirable as a temporary measure, not necessarily involving the termination of the original indenture. The chairman promised to consider the matter further and to lay before the ensuing meeting proposals for meeting the various contingencies referred to.

Arising out of some comments by Mr. Hugh Davies, the chairman also promised to draft for the approval of the Council a short summary of the National Apprenticeship Scheme, for issue in leaflet form. After a short discussion on the arrangements for the evening public meeting, the proceedings terminated.

In the evening a joint meeting of employers and operatives was held in the Great Hall of the Central Technical College at 7.30 p.m. Dr. W. E. Sumpner took the chair.

Mr. Lesser, the Chairman of the Council, explained the necessity of a thorough training for boys entering the plumbing industry if craftsmanship were to be maintained, and if advantage were to be taken of the modern discoveries in sanitary science and hygiene. He then briefly explained the scheme, its method of working, the reason why there were four parties to the indentures, and the obligations which each party undertook. He made a strong appeal for the constitution of a local council in Birmingham.

Mr. Walker, who had been acting as local secretary of the Birmingham Joint Industrial Council for the Plumbing Trade, explained that a meeting of the Joint Industrial Council had been held about a fortnight before, and that the representatives of the employers and operatives had approved a scheme, of which a draft had been sent to the hon. secretary for his comment, and which was substantially the same as the National Apprenticeship Scheme.

Mr. Lodge, speaking on behalf of the employers, endorsed Mr. Walker's statement, and said he hoped that the scheme would now be definitely started and worked in Birmingham on receiving the approval of the National Council.

Mr. Hoey said he hoped that, starting from Birmingham, the scheme would spread gradually from one town to another, just as it had done in Lancashire, where quite a number of the larger towns were now working the scheme.

Mr. Lesser said he regretted that the scheme had not been sent in in time to have been endorsed by the National Council at the meeting that afternoon, but he would endeavour to get endorsement by the Council at an early date.

After a vote of thanks to Dr. Sumpner for presiding and for the use of the hall, and to the chairman and secretary for attending, the meeting terminated.

Excavations in Roman Wales.

The 20th annual report of the National Museum of Wales, Cardiff, states that in 1926-7 the Department of Archæology continued to take an active part in field work in Wales. Further work has been done by the Director of the Museum, Mr. Cyril Fox, in the systematic investigation of Offa's Dyke.

The Keeper of the Department of Archæology, Mr. V. E. Nash-Williams, on behalf of the Caerleon Excavation Committee, undertook the direction of the large-scale excavations carried out at and within the western angle of the Roman legionary fortress at Caerleon. The first season's work has laid bare four large L-shaped barrack buildings, together with part of the main culvert system of the fortress. In size and plan the buildings compare closely with analogous structures excavated at Neuss, on the Rhine. The Keeper also visited the excavations carried out on the site of the Roman fort at Forden, Montgomeryshire, and at Kenfig Castle, Glamorgan.

WORKMEN'S COMPENSATION IN 1926

THE statistics have recently been issued of the working of the Workmen's Compensation Acts and the Employers' Liability Act during the year 1926. Two disturbing factors have been introduced affecting these statistics, the one permanent and the other transitory. The permanent factor is that after the year 1921 all statistics relating to Ireland have been eliminated, both as regards Northern Ireland as well as the Free State. The transitory factor was the coal stoppage. This reduced the number of cases and consequently the amount of compensation paid in respect of new cases, but it also increased the compensation paid in cases of partial incapacity as it delayed disabled men from returning either to full employment or light work.

The value of this non-contributory form of insurance is shown by the total amount paid in compensation in the seven great groups of industries in which statistics can be called for under section 42 of the Act of 1925—Mines, Quarries, Railways, Factories, Docks, Constructional Work and Shipping, the total amount being £6,006,921. But this figure represents only the actual amount paid to workmen and their dependants and not the total charge on the industries in respect of compensation. If the administrative expenses and medical and legal costs, etc., were taken into consideration it is estimated in the Report that in the seven great industries the total amount paid in respect of workmen's compensation would approximate £7,850,000, whilst the amount so far as it can be estimated paid in other industries would be in the region of £3,550,000, giving a total for all industries of £11,400,000.

In the coal-mining industry the charge arising under the Act, calculated simply on the basis of the compensation paid, works out at about 5d. per ton of coal raised as compared with 3.1d. in 1925, the difference being accounted for by the increase in the average amount paid in disablement cases due to the effects of the coal stoppage. As regards factories, from an inquiry recently made by the Ministry of Labour it appears the charge works out at a little under 1d. per £1 of wages, whilst for quarries and constructional work it represents between 2d. and 2½d. In the case of railway companies it is just under 1d. in the £, about the same as in 1925, and in shipping 3.8d. per ton of shipping as compared with 3.4d. in 1925.

The aggregate number of persons coming within the provisions of the Acts was, in the seven great industries in 1926, 7,001,795 as compared with 7,541,014 in 1925. In the last six years there is great uniformity in the numbers. They run :—

1921	7,315,866	1924	7,512,359
1922	7,205,609	1925	7,541,014
1923	7,342,311	1926	7,001,795

whilst 1913, the clear pre-war year, was 7,509,353.

In 1926 the average payment in case of death was £288 as compared with £285 in 1925 and £161 in 1914. In case of disablement the average payment (including cases settled by payment of a lump sum) was £14 9s. as compared with £12 4s. in 1925 and £6 7s. in 1914. The average amount paid in lump sums was £83 9s. as against £82 10s. in 1925 and £28 4s. in 1914. The average amount paid in weekly payments (including weekly payments made before settlement by a lump sum) was £10 10s. as compared with £8 19s. in 1925 and £4 14s. in 1914. Lump sums averaged £83 9s. as against £82 10s. in 1925 and £28 4s. in 1914. One reason for the increased sum paid in compensation is the Amending Act of 1923, and the Report contains a comparison of the average amount of compensation paid in fatal and non-fatal cases in the triennial period 1921-3 as compared with the period 1924-6 to bring out the effect of the

Amending Act. In this table it must be remembered that in the first year of the first period the statistics include figures from Ireland, but the Report states they do not make a material difference.

In the period above taken, the average amount paid in fatal cases has risen from £219 18s. in the first triennial period to £281 16s. in the second period, and this is attributed to the increased compensation provided in fatal cases by the Act of 1923, particularly in cases where the dependants include children under the age of 15. From the returns received from County Courts it appears that the total amount of the additional compensation paid in all industries in respect of children under 15 years of age was no less than £211,022. The average amount in the two periods paid in non-fatal cases has fallen from £15 4s. in the first period to £12 16s. in the second, but this is attributed to the cessation of war-bonus payments under the War Addition Acts.

Industrial Diseases.

As might be expected, where disease is the "accident," the duration of the period during which compensation is payable is far higher than in cases of injury. In the seven industries the proportion of "continued cases" was 60.6 of the total number of disablement cases, whereas in accident cases the proportion was only 14.8 per cent. The steady increase in miners' nystagmus cases appears a serious feature. This disease was first scheduled in 1908, and it is natural that in the first few years the number of cases should be small, but taking the year 1921 and comparing it with 1926 the number of cases has nearly doubled—4,804 old cases in 1921 as compared with 8,270 in 1926. Dermatitis is also increasing: in 1919 the cases numbered 270, in 1926 they numbered 837.

Administration.

The total number of cases brought before the Courts was 6,311, but many of these were applications for dealing with allowances already granted, and many were disposed of without the actual intervention of the Court, so that the total number of original claims settled with the cognisance of the Courts was only 2,947. The number of applications for arbitration has decreased by more than 30 per cent. on the pre-war figures. 27,775 memoranda were registered in 1926 as against 29,771 in 1925. There were 109 appeals to the Court of Appeal as compared with 95 in 1925. There were 11 appeals to the House of Lords.

The law of Workmen's Compensation has at last become better understood in the light of the hundreds of decisions that have been obtained upon the very complicated wording adopted in the Acts, and so far as we can gather from the statistics the Amending Act of 1923 did not cause any serious revival in litigation.

The Building Trade.

In the building trade in England and Wales there were 409 applications for arbitration as against 399 in 1925, and 2,040 memoranda were registered as against 1,996.

The Workmen's Compensation Acts have steadily replaced the remedy under the Employers' Liability Act, the total number of cases brought under the latter Act was 42 as compared with 41 in 1925, but out of this total eight actions were assigned to the building trade and 24 to factories and workshops. This is only an incomplete summary of some of the information contained in this Report.

A Reappointment.

The election of an organising secretary for the Scottish Building and Monumental Workers' Union has resulted in the reappointment of Mr. John F. Armour, of Glasgow, by a large majority. He has been organising secretary for the union for a considerable number of years.

NEW BUILDINGS IN LONDON

The Editor would be glad to receive information for publication under this heading from architects, builders, or other persons concerned.

Catford.—Premises.—The justices have sanctioned the application of Messrs. Barclay, Perkins and Co., Ltd., brewers, to build a "model" public-house. The cost is estimated at £42,000. The architect is Mr. F. G. Newnham.

Catherine-street.—Theatre.—A new theatre is to be built on the vacant site in Catherine-street, Aldwych, W.C., by Messrs. Arthur Gibbons & Dennis Eadie. Accommodation will be provided in the auditorium for 500 persons, including one circle. The architect is Mr. Ewen Barr. 1, Lincoln's Inn-fields, W.C.1.

Chiswick.—Extensions.—The scheme for the extension of the Brentford municipal market at Kew Bridge is estimated to cost £30,000. The plans have been prepared by Mr. Edward Willis, surveyor to the Chiswick U.D.C. The building contract has not yet been let.

Commercial-road. — Rebuilding. — The "Popular" picture theatre, at 515, Commercial-road, E., owned by Mr. P. Hyams, is to be rebuilt with a total seating accommodation for 3,500 persons. The architect is Mr. George Coles, F.R.I.B.A., Craven-street, Strand, W.C.2.

Croydon.—Station.—Plans have been prepared for a new petrol service station, garage, showrooms, etc., on a site at the corner of London-road and Midhurst-avenue. The architects are Messrs. North, Robin and Wilsdon, 35-39, Maddox-street, W.1.

Ealing.—Alterations.—Messrs. Lilley and Skinner, Ltd., boot manufacturers, propose to carry out alterations to shop and showrooms premises in Uxbridge-road, W.3. The plans have been prepared by Mr. S. Gordon Jeeves, F.R.I.B.A., 16, Hanover-square, W.1.

Elephant and Castle. — Conversion. — Messrs. J. Lyons & Co., Ltd., of Cadby Hall, W., are, it is stated, to acquire premises for conversion into a large branch restaurant and depot. Plans will be prepared by the company's architect.

Elephant and Castle.—Additions.—Improvements are to be carried out at the Elephant and Castle Theatre, S.E. The theatre is not to be pulled down, but the seating accommodation is to be increased from 1,400 to 2,000 or more. There are to be renovations and re-decorations, and the auditorium is to be modernised. The stage and dressing rooms are also to be redecorated.

Gerrard-street.—Extensions.—Chez Taglioni Restaurant, Ltd., have recently made a public issue of capital to provide funds for an extension of their premises.

Guilford-street. — Flats. — The ten-story blocks of flats proposed to be built on the Foundling Hospital site, and referred to in last week's issue, are being designed by Messrs. T. P. Bennett & Son, F.R.I.B.A., Bedford-row, W.C.

Hendon.—School.—We stated in our last issue that the accommodation provided in the Goldbeaters' School is for 120 scholars. We should like to point out that it should read for 1,200 scholars.

Kensington High-street. — Rebuilding. — It was announced at the annual meeting of Messrs. John Barker & Co., Ltd., that part of their premises in Kensington High-street are to be rebuilt. Mr. H. L. Cabuche, F.R.I.B.A., is the company's architect.

King's Cross.—Exchange.—The Commissioners of His Majesty's Works, etc., are inviting tenders for the erection of the "Terminus" Telephone Exchange, King's Cross, W.C.

Neasden.—Housing.—The Minister of Health has approved of the Willesden Urban District Council's proposal to lease a portion of the Neasden-lane frontage of the housing estate for the purpose of shop sites. The tender of Messrs. Gee, Walker & Slater, of £106,412, has also been accepted for the erection of 277 houses and flats on the Neasden estate.

Lambeth.—Building.—A new County Court for Lambeth is to be erected near Lower Kennington-lane, S.E.

Mitcham.—Factory.—The Mullard Radio Valve Co., Ltd., are to build a large reinforced concrete factory at New-road, at a cost of approximately £80,000, to plans prepared by their Surveyor, Mr. W. Horace Chapman. The builders are Messrs. Welwyn Builders, Ltd., Welwyn Garden City, Herts; and the concrete consultants, Messrs. Considere Constructions, Ltd.

Old Broad-street.—Enlargement.—National Provincial Bank, Ltd., are to enlarge their head offices by adapting premises at 21, Old Broad-street, E.C.2. The builders are Messrs. Turnbull and Son, 9, Northumberland-alley, E.C.3. The architect is Mr. F. C. R. Palmer, F.R.I.B.A., in collaboration with Mr. W. F. C. Holden, F.R.I.B.A.

Park-lane.—Hotel.—It is reported that building operations will start shortly upon the erection of the proposed palatial hotel on the Dorchester House site. The plans have been prepared by Messrs. Collcutt and Hamp, Wigmore-street, W.1.

Peckham.—Additions.—Alterations and additions are to be made to 82, Peckham High-street, S.E., in connection with its conversion into a large restaurant. The builders are Messrs. J. Marsland and Son, 56, Molton-street, W.1. Plans have been prepared by Messrs. North, Robin & Wilsdon, 35-39, Maddox-street, W.1.

Portman-square.—Flats.—The Prudential Assurance Co., Ltd., are to build two extensive blocks of flats in Portman-square, W.1, one site being at the corner of Orchard-street and 43-46, Portman-square, and the other comprising 2-9, Portman-square. The builders will be Messrs. Higgs and Hill, Ltd., South Lambeth-road, S.W.8. The architects are Messrs. Josephs, 2, Paul's Bakehouse-court, E.C.4.

Raynes-park.—Offices.—A site at the corner of the Kingston By-pass road has been acquired by the Cottenham Park Garages, Coombe-lane, S.W.20, who propose to build a group of lock-up garages, petrol-filling station, offices, etc.

Regent's-park.—Building.—The Buddhist Mission have decided to build a temple on a site in Gloucester-road, Regent's-park, N.W. The plans have been prepared by Mr. E. Bates, A.R.I.B.A., 27, Queen Victoria-street, E.C.4.

St. John's Wood-road.—Flats.—Through the agency of Messrs. Yates and Yates, the "Eyre Arms" and 21 adjacent cottages have been acquired by Mr. George Gee, of Duffield Bank, Derbyshire, principal in the firm of Messrs. Gee, Walker and Slater, Ltd., builders and contractors, 58, Pall Mall, S.W.1. It is proposed to build a block of flats. Plans have been prepared by Messrs. T. P. Bennett & Son, F.R.I.B.A., 41, Bedford-row, W.C.1.

Spitalfields. — Improvements. — Plans are being prepared by the Central Markets Committee of the City Corporation for a block of buildings to be erected at Spitalfields Market with the object of providing better facilities for the sale of imported fruit. The cost is estimated at £200,000.

Tottenham.—Rebuilding.—The governors of the Prince of Wales General Hospital are raising funds towards the cost of rebuilding and enlarging their out-patients' department, a sum of £50,000 being aimed at.

Twickenham.—Flats.—The M.H. have agreed to the acceptance, by the Council, of the tender of Messrs. Craig and Mace, Windsor House, Victoria-street, S.W.1, at £22,140, for 64 flats in Mugridge-road. Plans have been prepared by Mr. F. W. Pearce, York House.

Walworth-road. — Rebuilding. — The rebuilding of the Walworth-road Wesleyan church is estimated to cost £30,000.

RATES OF WAGES IN THE BUILDING TRADE

[Every endeavour is made to ensure accuracy but we cannot be responsible for errors.]

	Masons.	Bricklayers.	Carpenters Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Labourers.
Aberdare	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Accrington	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Alfreton	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Alnwick	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Altrincham	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Ashford Kent	1/4	1/4a	1/4	1/4	1/4	1/4	1/4	1/0
Ashington	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Ashton-under-Lyne	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Aylesbury	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Aylsham	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Banbury	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Barnsley	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Barnstaple	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Barrow-in-Furness	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Barry	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Basingstoke	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Bath	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Bedford	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Berwick	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Bexhill	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Birkenhead	1/10	1/10	1/10	1/11	1/10	1/10	1/9½	1/4½
Birmingham	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Bishop Auckland	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Blackburn	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Blackpool	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Bolton	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Bournemouth	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Bradford	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Bradford-on-Avon	1/4	1/4	1/4	1/4	1/4	1/4	1/3	1/0
Braintree	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Brentwood	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Bridgwater	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Bridlington	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Brighton	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Bristol	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Bromsgrove	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Bromyard	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	11½
Bungay	1/3	1/3	1/3	1/3	1/3	1/3	1/3	11½
Burnley	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Burton-on-Trent	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7	1/2½
Bury	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Buxton	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Cambridge	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Canterbury	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Cardiff	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Carlisle	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Chatham	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Chelmsford	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Cheltenham	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Chester	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Chesterfield	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Chorley	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Cirencester	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/3½	1/0½
Clacton	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Colchester	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Coventry	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Cranbrook	1/3	1/3	1/3	1/3	1/3	1/3	1/3	11½
Crewe	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Cromer	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Darlington	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Deal	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Denbigh	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Derby	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Devizes	1/4	1/4	1/4	1/4	1/4	1/4	1/3	1/0
Dewsbury	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Doncaster	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Dorchester	1/4	1/4	1/4	1/4	1/4	1/4	1/3	1/0
Dorking	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Dovercourt	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Driffield	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Droitwich	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Dudley	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Durham	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Eastbourne	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
E. Glam. (Mon.Val.)	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Ely	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Exeter	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/5½	1/2
Exmouth	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Fakenham	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Felixstowe	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Folkestone	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Frome	1/4	1/4	1/4	1/4	1/4	1/4	1/3	1/0
Glossop	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Gloucester	1/6	1/6	1/6	1/6	1/6	1/6	1/5	1/1½
Godalming	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Goole	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Gosport	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Grantham	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Great Yarmouth	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Grimsby	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Guildford	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Halifax	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Harpenden	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Harrogate	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Hartlepools	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Harwich	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Hastings	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Hatfield	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Hednesford	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Hereford	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/4½	1/1½
Herne Bay	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Hertford	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Hitchin	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Hoddesdon	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Holt	1/3	1/3	1/3	1/3	1/3	1/3	1/3	11½
Huddersfield	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Hull	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Hunstanton	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Huntingdon	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Isle of Wight	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	11½
Ipswich	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Keighley	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Kettering	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Kidderminster	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
King's Lynn	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Lancaster	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Leamington Spa	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Leeds	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Leicester	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Leighton-Buzzard	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Lichfield	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Lincoln	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Littlehampton	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Liverpool	1/10	1/10	1/10	1/11	1/10	1/10	1/9½	1/4½
Llandudno	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Llanelly	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
London:								
12 m. radius	1/9	1/9	1/9	1/9	1/9	1/9	1/8	1/4
12-15 m. radius	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/7½	1/3½
Loughborough	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Lowestoft	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Luton	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Macclesfield	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Maidstone	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Malvern	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Manchester	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Mansfield	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Margate	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Market Harb'rough	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Matlock	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Melton Constable	1/3	1/3	1/3	1/3	1/3	1/3	1/3	11½
Melton Mowbray	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2½
Merthyr Tydfil	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Middlesbrough	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Newark	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Newbury	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0½
Newcastle-on-Tyne	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Newcastle-ur-Lyme	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
New Forest	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Newmarket	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Newport, Mon.	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Northampton	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Norwich	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2½
Nottingham	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Nuneaton	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Oakham	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Oldham	1/7½	1/7½	1/7½	1/7½	1/7½	1/7	1/7½	1/2½
Oxford	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Paignton	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Peterborough	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Plymouth	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/6½	1/2½
Pontypridd	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Portsmouth	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Preston	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Ramsgate	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Reading	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Redcar	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Redditch	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Reigate	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Retford	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Ripon	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Rochdale	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Rochester	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Rugby	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Saffron Walden	1/3	1/3	1/3	1/3	1/3	1/3	1/3	11½
St. Albans	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
St. Helens	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Sawbridgeworth	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Saxmundham	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	11½
Scarborough	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Sevenoaks	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Sheffield	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Shrewsbury	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Sittingbourne	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Southampton	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Southend-on-Sea	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Southport	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
South Shields	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Stevenage	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Stockport	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Stockton-on-Tees	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Stoke-on-Trent	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Stourbridge	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Stourport	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Stowmarket	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Stratford-on-Avon	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Stroud	1/5	1/5	1/5	1/5	1/5	1/5	1/4½	1/0½
Sunderland	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Swaffham	1/3	1/3	1/3	1/3	1/3	1/3	1/3	11½
Swansea	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Swindon	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/4½	1/1½
Tamworth	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Taunton	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Thetford	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Torquay	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Totnes	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4	1/0½
Trowbridge	1/4	1/4	1/4	1/4	1/4	1/4	1/3	1/0
Tunbridge Wells	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Uttoxeter	1/5	1/5	1/5	1/5	1/5	1/5	1/5	1/0½
Wakefield	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Walsall	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Wallsend	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Warminster	1/4	1/4	1/4	1/4	1/4	1/4	1/3	1/0
Warrington	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Warwick	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Wells (Norfolk)	1/3	1/3	1/3	1/3	1/3	1/3	1/3	11½
Welwyn Gar. City	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
West Bromwich	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Weston-sup.-Mare	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Weymouth	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/3½	1/0½
Whitby	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/2
Wigan	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Winchester	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Windsor	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/5½	1/1½
Wisbech	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Wolverhampton	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½
Woodbridge	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/0
Worcester	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Worksop	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/1½
Worthing	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/4½	1/0½
Wrexham	1/7	1/7	1/7	1/7	1/7	1/7	1/7	1/2½
Wroxham	1/3	1/3	1/3	1/3	1/3	1/3	1/3	11½
Wymondham	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	1/3½	11½
York	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/2½

CONTRACTS, COMPETITIONS, &c.

For some contracts still open, but not included in this List, see previous issues. Those with an asterisk are advertised in this number. Certain conditions beyond those given in the following information are imposed in some cases, such as that advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed, that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given is the latest date when the tender, or the names of those willing to submit tenders, may be sent in, the name and address at the end is the person from whom or place where quantities, forms of tender, etc., may be obtained.

Following is a list of abbreviations:—Borough Surveyor, B.S.; Borough Engineer, B.E.; District Surveyor, D.S.; Clerk, C.; Town Clerk, T.C.; County Engineer, C.E.; County Surveyor, C.S.; County Architect, C.A.; Surveyor, S.; Engineer, E.; Borough Architect, B.A.; Architect, A.

BUILDING, PAINTING, ELECTRIC LIGHTING, HEATING, ETC.

APRIL 14.

***Sutton-in-Ashfield.**—Houses, Roads, Pavements and Sewers.—(1) 56 houses, (2) roads, pavements and sewers, for U.D.C. Warner, Bocock & Dean, architects and surveyors, Mansfield-rd. Dep. £3 3s.

APRIL 15.

***London, E.**—Verandah.—To South Ends of Joy and Charity Wards at the Eastern Fever Hospital, Homerton-grove, Homerton, for the M.A.B. Office of the Board, Victoria Embankment, E.C.4. Dep. £1

APRIL 16.

Belfast.—Wall.—Concrete boundary wall with entrance gate at Wellington Park House, University-rd., for C.B. City S.

Bootle.—Rebuilding.—Taking down and rebuilding boundary walls on north-east and south-east corners of junction of Marsh-lane and Litherland-rd., for C.B. B.E.

Bury.—Alterations.—To existing premises, The Wylde, for use as clinics, for Health and Education Committee. J. A. Settle, B.E. Dep. 10s.

Dundee.—Heating.—Installation at Rutterburn Public school. W. Hutchison, Clerk to Authority.

Leeds.—Fencing.—Provision of approximately 400 lin. yds. of unclimbable iron fencing, for T.C. H. Shortreed, Waterworks Manager.

Leeds.—Masonry.—Stone dwarf wall, approximately 400 yds. in length, at Headingley filter beds, Otley-rd., and erection thereon of similar length of iron railings, for Waterworks Committee. Waterworks Department, 26, Great George-st.

Littlemore.—Painting.—Outside of buildings of Littlemore Hospital. Engineer at Hospital.

Liverpool.—Additions.—Also alterations, to Butler-st. Council school, for T.C. Land Steward and Surveyor. Dep. £2 2s.

Menston. — Painting. — External of several buildings at Mental Hospital, Menston, near Leeds, for West Riding Mental Hospital Committee. W. E. H. Burton, Architect and Engineer.

Pontrobert. — Repairs. — Also renovation of Wesleyan Chapel, Pontrobert. Mr. Bennett. The Smithy, Pontrobert

Whitley Upper.—Houses—10 stone-built and blue-slated two-storied non-parlour-type Council houses at Denby-lane, Grange Moor, for U.D.C. E. G. Hollingworth, S., South View-terr., Grange Moor

APRIL 17.

Birkenhead.—Garage.—Motor-bus garage on land fronting Plumer-st., for T.C. R. W. Johnston, B.E. and S. Dep. £1 1s.

Bootle.—Houses.—23, in Linacre-lane and Fernhill-rd., for C.B. B. E. and S. Dep. £2 2s.

Braintree.—Houses.—58 houses at Bocking, 16 at Cressing, 24 at Coggleshall, 12 at Kelvedon, 12 at Rivenhall, 6 at White Notley, for R.D.C. E. O. Wheeler, surveyor, St. Peter's-close, Bocking.

Bridlington.—Heating.—Accelerated low-pressure hot water heating at Bridlington P.O., etc., for H.M.O.W. Contracts Branch, H.M. Office of Works, King Charles-st., S.W.1. Dep. £1 1s.

Cardiff.—School.—Elementary school in Grand-av., Ely, for E.C. G. H. Whitaker, architect to E.C. Dep. £2 2s.

Docking.—Houses.—4, at Brancaster, for R.D.C. A. B. Nowell, Building Surveyor, York-av., New Hunstanton. Dep. £1.

Leeds.—Painting.—Inside at Holbeck Institution, for B.G. H. Ford, clerk, 11, South-parade.

Plymouth.—Houses.—267 (in brickwork) for the Plymouth C.B. J. Wibberley, B.E., Sun Buildings, Plymouth. Dep. £2 2s. to Boro. Treasurer.

Rathmines and Pembroke.—Wiring.—Electrical work at Isolation Hospital, at Clonskeagh, for Joint Hospital Board. S. Mason, clerk.

Ruthin.—Additions.—For *(a)* alterations and additions, *(b)* internal decorations and external painting, *(c)* installation of low pressure heating apparatus, at the Constitutional Club, for Committee. G. R. Griffith, architect, 2, Post Office-lane, Denbigh.

St. Albans.—Wing.—New X-ray wing at the St. Albans and Mid-Herts hospital, Church-crescent, St. Albans, for Committee. W. G. Marshall, secretary, Church Crescent.

Sheffield.—Alterations.—To existing offices, Sheaf-st., for T.C. S. E. Fedden, General Manager and Engineer, Commercial-st. Dep. £1 1s.

Sheffield.—Houses.—58 on Wybourn estate, for T.C. W. Geo. Davies, F.R.I.B.A., City Architect. Dep. £2.

Stocksbridge.—School.—For (1) low pressure hot water installation, and (2) installation of electric lighting, at New school, for West Riding E.C. Education Department, County Hall, Wakefield.

Whitley Lower.—Premises.—For Firfield Industrial Co-operative Society, Ltd. General Manager at the Society's Offices, Knowles-st., Mirfield.

APRIL 18.

Liverpool.—Dwellings.—30 tenement dwellings on Pitt-st. area, for T.C. Acting Director of Housing. Dep. £1 1s.

London.—Electric Lighting.—Installation on fire escape stairs at Northern Fever Hospital, Winchmore-hill, N.21, for M.A.B. T. Cooper, Engineer-in-Chief. Dep. £1.

***London, N.**—Internal and External Cleaning, Painting and Repairs.—At Northern Hospital, Winchmore Hill, for the M.A.B. Office of the Board, Victoria Embankment, E.C.4. Dep. £1.

***Portland.**—Houses.—16, of various types upon St. Martin's estate, Portland, for the U.D.C. R. Davison, E. and S. Dep. £1 1s

Ripon.—Houses.—28 houses and 6 bungalows, for T.C. J. Henry Gough, T.C.

Rochdale.—Extension.—Of bus garage in Mellor-st., for Tramways Committee. B.S.

Rochdale.—Steelwork.—Also reinforced concrete floor to engine-room, at Electricity Works, Dane-st., and erection and completion of electricity sub-station in Baron-st., for Corporation. B.S.

***Various Places.**—Cleaning, Painting and Repair Works.—At various hospitals, for the M.A.B. Office of the Board, Victoria Embankment, E.C.4. Dep. £1 in respect of each work.

APRIL 19.

Binbrook.—Repairs.—Also decorations to interior of Wesleyan Church, for Trustees. T. H. Elliott, Ingleside, Binbrook, Lincoln.

Cardiff.—Garage.—Warehouse garage, etc., at Pengam, for G.W.R. Engineer, Paddington Station, W.2. Dep. £2 2s.

Dover.—Elementary School with Conveniences and Contingent Works.—At Astor-av., for the Corporation. Wm. Boulton Smith, B.E., Maison Dieu House, Dover. Dep. £2 2s.

Greenwich.—Alterations and Repairs and Redecorations.—Conversion to two maisonettes at "The Woodlands," Vanbrugh-hill, Greenwich, S.E.10, for the Guardians of the Greenwich Union. Alfred Roberts, F.R.I.B.A., 92, London-st., S.E.10. Dep. £2

Hartley Wintney.—Houses.—20, semi-detached cottages at Marrowbrook-lane, Cove, for R.D.C. E. H. Milburn, clerk. Dep. £1.

Hull.—School.—Senior block, Francis Askew school, Dairycoats, for E.C. City Architect.

Kingston-upon-Thames. — Endowed Schools properties situate in Portsmouth-rd., Surbiton, and comprising two dwelling-houses and land, total area 19,547 sq. yds. A. W. Forsdike, T.C.

Lanarkshire.—Brickworks known as Carfin Brickworks, belonging to the Lanarkshire County authorities. W. E. Whyte, Dist. Clerk, Dist. Offices, Hamilton.

London.—Painting.—Cleaning and repainting station buildings, etc., at following places:—Cropredy, Fenny Compton, etc.; Birmingham (Snowhill); Cannock-rd. Junction, Oxley Sidings, etc.; Codsall, Albrighton, etc. Halesowen; Stourbridge; Worcester; Paddington (Gt. Western Royal Hotel); Millwall Docks, Victoria and Albert Docks, and Minories; Taplow, Twyford, etc.; West Brompton, Chelsea, etc.; Hayes, West Drayton, etc.; Bledlow, Wheatley, etc., for G.W.R. F. R. E. Davis, secretary, Paddington Station, W.2.

Newport.—New Station Buildings.—At Newport High-st. Station, for the G.W. Railway Co. The Engineer at Paddington Station. Dep. £2 2s.

APRIL 20.

Athy. — Improvement. — Sanitary improvement works at County Home, for Kildare Board of Health and Public Assistance. G. J. Gardinder, engineer.

Bedford.—(a) Houses, (b) Roads and Sewers.—76 houses for the Bedford T.C. N. Greenshields, A.M.I.C.E., B. E. and S., Newnham House, Housel-lane. Dep. £2 2s. for each contract.

Edinburgh.—Building.—Mason, concrete, and steel works of building for screening plant at Craigmillar Quarry, for T.C. E. J. MacRae, A.R.I.B.A., City Architect.

Great Yarmouth.—Houses.—41 non-parlour, on Maygrove estate, for C.B. Dep. £2 2s.

Henley.—Installation.—Of electric light, at 78, West-st., Henley-on-Thames, for B.G. T. L. Easby, clerk, Bank-chambers, 12, Hart-st. Dep. £1 1s.

Kildare.—Improvements.—Sanitary improvement works at County Home, Athy, for Board of Health and Public Assistance. George J. Gardinder, engineer.

London.—Stores and services, etc., for the periods of 6 and 12 months, commencing June 1, 1928, for the Metro. Water Board. Chief Engineer, 173, Rosebery-av., E.C.1 (Room 156).

Portsmouth.—Alterations.—Also additions to Old Inquiry Office and convenience, Western-parade, Southsea, for T.C. R. J. Jenkins, City E.

Salford.—Wall.—Setting back portion of boundary wall of the Manchester Racecourse at corner of Cromwell-rd. and Littleton-rd., and erection of shed, for T.C. E. J. Bentley & Son, building surveyors, Deansgate House, 274, Deansgate, Manchester.

APRIL 21.

Ballymena.—School.—Erection of new school. M'Carthy & Lilburn, Quantity Surveyors, Scottish Provident-buildings, Belfast. Dep. £1 1s.

Bradford.—Various Trades.—At Tramways Department Offices, 11, Forster-sq., for T.C. City Architect.

Pudsey.—Houses.—For *(a)* 10 parlour type, *(b)* 10 scullery type, *(c)* 96 scullery type, for T.C Basil H Noble, B.S. Dep. £5.

Sternoway.—Houses.—20, of 3-apartment type of 5 blocks of 4 houses each, in Plantation-rd. B.S.

APRIL 23.

Blackrock.—Alterations.—To Blackrock Seawater Baths, erection of concrete stands for seating accommodation, with dressing-rooms and sanitary conveniences, and platform for diving, for U.D.C. S.

Clutton.—Lighting.—Installation of electric light at Institution, for B.G. T. Hood, engineer, 40, Queen's-rd., Clifton, Bristol. Dep. £2 2s.

***Enfield.**—Public Convenience.—In Church-st., Enfield, for the U.D.C. Council's Surveyor, Public Offices, Enfield. Dep. £2 2s.

Epsom.—Painting.—External and internal distempering, etc., to cottages at Woodmansterne, Headley, Burgh Heath and Ewell, for R.D.C. W. T. Wooldridge, S.

Gloucester.—New Kitchen.—At the Wotton Mental Hospital, for the Committee of Visitors of the Gloucester County and City Mental Hospitals. Charles Martin, Clerk of Works at the Hospital. Dep. £2 2s.

Prestwich.—Fencing.—500 yds. of deal paling fence and approximately 100 yds. of lattice and close board screen fencing, for U.D.C. S.

Prestwich.—Floors.—Repairs and relaying of floors on Council's housing estates, for U.D.C. S.

St. Albans.—Cottage.—At Sandridge-rd. depot, for T.C. F. T. Negus, City E. and S., 38, St. Peter's-st.

Sheffield.—Building.—Two new ward blocks, etc., at Lodge Moor hospital, for T.C. W. Geo. Davies, F.R.I.B.A., City Architect. Dep. £2.

Southport.—Library.—Branch library in Liverpool-av., Ainsdale, for C.B. A. E. Jackson, B.E. Dep. £1 1s.

Willesden.—Hospital Buildings.—New observation ward block and a new nurses' quarters block and incidental works at Dog-lane. F. Wilkinson, M.Inst.C.E., Town Hall, Dyne-rd., Kilburn, N.W.6. Dep. £2 2s.

Winchester.—Painting.—Summer repairs at several elementary schools, for E.C. City S.

Wotton.—Kitchen.—At Wotton Mental Hospital, for Visitors. C. Martin, Clerk of Works. Dep. £2 2s.

APRIL 24.

Newton Abbot.—Houses.—4, at Abbotskerswell, for R.D.C. B. H. Palmer, L.R.I.B.A., 11, Union-st

Steeton.—Electric Light.—Installation at Steeton Council School, for West Riding C.C. B. Thornton, Divisonal Clerk, Education Office, Skinton.

***West Ham.**—Extension.—To the Fire Brigade Station, North Woolwich-rd., Silvertown, for the West Ham C.B. B.E., Town Hall, West Ham, E. Dep. £1.

APRIL 25.

Dublin.—Building.—Building works and supplies, for Commissioners of Public Works. T. Cassedy, secretary, Office of Public Works. Dep. £1.

Hyde.—Stonework.—In connection with new entrance gates to the park, for Corporation. B.S.

***Poplar.**—Exterior Painting.—Of St. Andrew's Hospital, Bromley-by-Bow, E.3, for the Poplar Guardians. Harley Heckford, B.E. and S., Council Offices, High-st., E. Dep. £2 2s. to the Clerk.

APRIL 26.

***Bexhill.**—Pavilion, Grand Stand and Lavatories.—In the Polegrove, Bexhill, for the B.C. Geo. Ball, B.S. Dep. £1 1s.

Down.—Building.—For (1) Killinchy P.E. school, Killinchy, Co. Down, building alterations and additions, steel casements, steel works; and (2) Windsor Hill P.E. school, Newry, Co. Down, wood block flooring, terrazzo flooring, wall tiling, for County E.C. Castor J. Love, architect and civil engineer, 11, Chichester-st., Belfast. Dep. £2 2s.

***London, W.C.**—Telephone Exchange.—"Terminus," King's Cross, for the Commissioners H.M.O.W. Contracts Branch, King Charles-st., S.W.1. Dep. £1 1s.

Southwick.—Flats.—16 self-contained flats and 8 cottages in St. Aubyn's-rd., Fishersgate, for U.D.C. G. W. Warr, S. Dep. £1 1s.

Stirling.—Building.—New police station at Spittal-st., for T.C. A. H. Goudie, B.E. Dep. £1.

Sutton-in-Ashfield.—Houses.—56 non-parlour type, on Kirby-rd. site, for U.D.C. Warner, Bocock & Dean, architects and surveyors, Mansfield-rd. Dep. £3 3s.

MAY 3.

***Southampton.**—School.—New Council school at Wherwell, for the C.B. of Southampton. A. L. Roberts, C.A., The Castle, Winchester. Dep. £1 1s. by cheque payable to the "Hants County Council" and crossed "Lloyds Bank, Ltd., Winchester."

***Southampton.**—School.—New Council school at Totton, for the C.B. of Southampton. A. L. Roberts, C.A., The Castle, Winchester. Dep. £1 1s. by cheque payable to the "Hants County Council" and crossed "Lloyds Bank, Ltd., Winchester."

MAY 8.

***London.**—Public Baths and Wash-houses.—In Weston-st., Bromley-by-Bow, E., for the Poplar B.C. Harley Heckford, B.S. Dep. £3 3s

NO DATE.

Ashbourne. — Manse. — New Wesleyan manse. Naylor, Sale and Woore, architects, Market-place, Derby.

Ipswich.—Housing.—50 parlour and 50 non-parlour houses on Gainsborough-lane site, for T.C. E. McLauchlan, B.S. and Water E. Dep. £2 2s.
Ratby (near Leicester).—Room.—Concert room to Working Men's Club and Institute. Robey E. Carpenter & Son, quantity surveyors, Palace-chambers, Leicester. Dep. £1 1s.
Rotherham.—Painting.—Also interior cleaning and decorating, including repairs to plaster and exterior painting of Thurcroft Miners' Welfare Hall. T. W. Gilman, Thurcroft Main Colliery, nr. Rotherham
Sturton.—Partition.—Folding sliding partition, Sturton school. Schoolmaster, Sturton, Retford.

MATERIALS, ETC.

APRIL 16.

Belfast.—Iron Castings.—For C.B. City S.
Birkenhead.—Cement, etc.—For C.B. F. E. Spencer, Borough Electricity Engineer.
Loughton.—Limestone, etc.—For U.D.C. H. White, S.
Witham.—Highway Materials.—For U.D.C. D. Jenkinson, S.

APRIL 17.

Aberdeen.—Paints, etc.—For P.C. G. W. Reid, inspector and clerk, 20, Union-ter.
Bootle.—Kerb.—For C.B. B.E.
Headington.—Highway Materials.—For R.D.C. Wm. Page Webb, S.

APRIL 18.

Carshalton.—Road Materials.—For U.D.C. R. A. Hutson, S.
Wednesbury.—Highway Materials.—For T.C. A. Booth, B.E. and S.

APRIL 19.

Lochgilphead.—Paints, etc.—For Argyll and Bute District Mental Hospital Committee. House Steward.

APRIL 20.

Edinburgh.—Builders' Materials.—For P.C. W. M. Mowat, Inspector and Clerk.
London.—Cement, etc.—For M.W.B. Chief Engineer.
Northfleet.—Road Materials.—For U.D.C. C.

APRIL 21.

Farnborough.—Road Materials.—For U.D.C. J. E. Hargreaves, S.

MAY 1.

Cairo.—Asphalt.—For Egyptian Ministry of Public Works. Department of Overseas Trade, 35, Old Queen-st., S.W.1. (B.X. 4263).

ENGINEERING, IRON AND STEEL.

APRIL 12.

Bridlington.—Adits.—Driving or extending of existing adits at waterworks pumping station, for T.C. W. Thompson, Waterworks Engineer, Marton-rd.

APRIL 16.

Reigate.—Sewage.—Small sewage disposal scheme at "The Clears," Reigate, comprising brick sedimentation tanks and percolating filters in duplicate, together with works of drainage, for T.C. F. T. Clayton, B.E. and S. Dep. £1 1s.

APRIL 20.

London.—Bridgework.—93 tons, for India Store Dept. Director-General, Belvedere-rd., S.E.1
Muirkirk.—Water Supply.—Forming an intake, laying a 5-in. cast-iron conduit about 275 yds. long excavating about 16,000 cubic yds. of material to form an extension to existing reservoir, laying and jointing about 800 yds. of 5 and 4 cast-iron pipes for additional water supply to village, for D.C. of Ayr C.C. J. B. Brodie, 141, West George-st., Glasgow. Dep. £2.

APRIL 21.

Lytham St. Annes.—Extensions.—Overflow weir, screen house and chamber, etc., together with about 240 yds. of 36-in. concrete tubes, a manhole, and about 54 yds. of 36-in. C.I. pipes, for T.C. G. W. Lawson, B.E. and S. Dep. £3.
Todmorden.—Reconstruction. — Sewage disposal works at Sandbed, for T.C. H. Crabtree, B.E. Dep. £2.

ROAD, SEWERAGE, AND WATER WORKS.

APRIL 16.

Finchley. — Paving. — Providing and laying creosoted deal blocks, including reinforced concrete foundations in main roads, for U.D.C. P. T. Harrison, E. and S., 9, The Hawthorns, Regent's-park, N.3.
Finchley.—Improvements.—In East End-road, for U.D.C. P. T. Harrison, engineer, 9, The Hawthorns, Regent's Park-rd., Finchley, N.3. Dep. £2.
Hewth.—Sewer.—At Evora-terrace, for U.D.C. F. Higginbotham, S., 3, Clare-st., Dublin.
Plymouth. — Making-up. — Salcombe-rd., St. George's-av., Wembury Park-rd., Salcomb-rd.-lane South, Rowden-st.-lane North, for C.B. J. Wibberley, B.E., S. and A. Dep. £2 2s.
Romford.—Sewerage.—Sewers across private lands and in Moor-lane and Front-lane, Cranham, for R.D.C. W. J. Grant, S.
Scarborough.—Levelling.—Also draining and sodding of 4 acres of land in Burniston-rd., for formation of hockey pitches, for T.C. H. W. Smith, B.E.
Yeovil.—Mains.—Laying of 3½ miles of 12-in., 9-in. and 6-in. water mains, between Evershot and Cattistock farm, for T.C. A. J. Price, Water Engineer.

APRIL 17.

Cardiff.—Making-up.—Heath Park-av., Sturminster-lane, Sandringham-lane, Newminster-lane, Colchester-av., Southminster-lane, Dorchester-av., Rosemount-lane, Southcourt-rd., Clodien-av., Colchester-lane South, Cedars-lane, Southcourt-lane, Maplewood-av., Newminster-rd., Gileston-lane East, Minster-rd., Victoria Park-lane North, Sturminster-rd., Victoria Park-lane West, for T.C. City E.
Prestwich. — Making-up. — Also sewering and draining of Lichfield-drive, for U.D.C. M. A. Piercy, E. and S. Dep. £1 1s.
Renfrew.—Widening.—Of Eastwood main road from Spiers Bridge to Eastwood Toll, a distance of about 1,600 lin. yds., for C.C. Kyle & Frew, engineers, 227, West George-st., Glasgow, C.2. Dep. £2.
Salford.—Paving.—Also completing 2 streets with tarmacadam, for T.C. City E.

APRIL 18.

Bexhill.—Main.—Excavation of approximately 2,000 yds. of trenchwork for 9-in. cast-iron main, and the carting of 145 tons of pipes and specials, for T.C. E. Pollard, Water Engineer. Dep. £1 1s.
Birkenhead.—Making-up.—Of Temple-rd., for Corporation. R. W. Johnston, B.E. and S. Dep. 10s.
Birmingham.—Paving.—Supplying and laying hand-laid granited rock asphalt paving in Chester-st., Aston, approximate area being 980 sq. yds., for T.C. H. H. Humphries, City E. and S. Dep. £1.
Bushey.—Tarpaving.—Of footpaths, Herne-rd. (part), and Melbourne-rd. (part), for U.D.C. E. R. Ryder, E. and S.
Hartley Wintney.—Main.—Construction of about 475 ft. of 2-in. cast-iron water main, together with fire hydrant and valve; also construction of about 442 ft. of 6-in. stoneware sewer, with manholes and other works incidental thereto, for R.D.C. E. H. Milburn, C. Dep. £1 1s.
Leyburn.—Tar-spraying.—Approximately 150,000 super yds., for R.D.C. P. Utley, District Surveyor.
London.—Paving.—Paving and forming roadway and footways of Tatnell-rd., Forest Hill, for Lewisham B.C. B.S.
Mexborough.—Main.—For (a) laying and jointing of approximately 3,700 yds. of 8 in. cast-iron spigot and socket water main, together with valves and accessories, and (b) construction of reinforced concrete collecting chambers, for U.D.C. J. B. Feltham, Engineer and Manager. Dep. £1 1s.
Orsett.—Resurfacing.—Kerbing, draining and resurfacing with tarmacadam, Dock-rd., Little Thurrock, for R.D.C. F. T. Johnson, Highways S.

APRIL 19.

London. — Paving.—Of Eastbourne-rd. (part), Streatham-vale (part), Stockport-rd., Greenock-rd., Fieldend-rd., Woodfield-grove and Mount Ephraim-lane (part), Streatham, and Gressenhall-rd., Southfields, for Wandsworth B.C. E. J. Elford, B.E., 215, Balham High-rd., S.W.17. Dep. £1 1s.

APRIL 20.

Bacup.—Improvements.—To (1) Bankside-lane, (2) Tong-lane, (3) Greave-rd., for T.C. F. W. Mozley, B.E.
Ruislip-Northwood.—Making-up.—Of Brickwall-lane, Ruislip, Windmill-way, Ruislip, Northgate, Northwood, for U.D.C. H. R. Metcalfe, E. and S. Dep. £1.

APRIL 21.

Coupar Angus.—Resurfacing.—Tarmacadam resurfacing etc., Queen-st., for T.C. J. A. R. Macdonald, B.S.
Sutton and Cheam.—Surface Tarring.—300,000 sq. yds. of roads with refined tar, for U.D.C. W. Hedley Grieves, E. and S.

APRIL 23.

Beddington and Wallington.—Improvements.—To Lavington-rd. (between Croydon-rd. and northern boundary of 31, Lavington-rd.), for U.D.C. S. F. R. Carter, E. and S. Dep. £1 1s.
Dumfries.—Water Supply.—Supplying and laying of 580 lin. yds. of 2-in. diameter cast-iron pipes to replace the existing 2-in. and 1½-in. branch mains, together with all special castings, valves, and other fittings; the transfer of the existing house connections to the new mains and all incidental works, for Thornhill, for C.C. W. C. Easton, Chartered Civil Engineer, 183, West George-st., Glasgow, C.2. Dep. £1 1s.
Hornsea.—Tarring.—Surface tarring about 90,000 super. yds. of various streets and roads, for U.D.C. H. W. Boardman, E. and S. Dep. £1 1s.
Liverpool.—Pipe-laying.—Laying of steel pipes of 42-in. internal diameter and other ancillary works, as follows:—From Ashton's Cross to Beeston Moss, in County of Chester, for distance of about 5⅔ miles, for Corporation. Water Engineer. Dep. £5 5s.
London.—Paving.—Reinforced concrete carriageway, and with artificial flags and gravel with granite kerb, the footways of Ashworth-rd., between Elgin-av. and a line drawn across Ashworth-rd. from party fence of 7 and 9, Ashworth-rd. to north fence of garage of 24, Ashworth-rd., for Paddington B.C. B.E. and S. Dep. £1 1s.
★**London.**—Surface Water Sewer.—In Lionel-rd., Brentford, for the Brentford and Chiswick U.D.C. Edward Willis, B.S., Town Hall, Chiswick, W.4.

APRIL 24.

Winchester.—Pipes.—Taking up existing 15-in. stoneware pipes and relaying with 15-in. cast-iron pipes, with turned and bored joints, for T.C. City E.

APRIL 25.

London.—Making-up.—Carriageways and footpaths in (1) Sawley-rd. (part), (2) Galloway-rd. (part), for Hammersmith B.C. R. Hampton Clucas, B.E. and S.
Salisbury.—Making-up.—Bouverie-av., for Corporation. W. J. Goodwin, City E. and S. Dep. £1 1s.

APRIL 26.

Bexhill.—Making-up.—Of Approach roads to Manor-rd. bridge, of approximate total length of 113 yds., for T.C. Geo. Ball, B.S. Dep. £1 1s.

Auction Sales, Tenders, etc.

APRIL 17.

London, N.—Joseph Hibbard & Sons. Without reserve. By order of Messrs. Boyd, Ltd., surplus stock, upon the premises, St. Ann's Works, St. Ann's-rd., surplus stock, plant and equipment of pianoforte manufacturers, saw mill plant, etc. Auctioneers, 15, Newington-green, Islington, N.16.
South Ealing.—J. Trevor will sell re Condual Construction Co., Ltd., by order of the Receiver, Sir Harold Moore, F.C.A., without reserve, at Pope's-lane, South Ealing, surplus building material of the Ealing Council village scheme. Auctioneer, 23, Coleman-st., E.C.2.

APRIL 18.

London.—Knight, Frank & Rutley, at Hanover-sq. Estate Room, "The Belmont Estate." Freehold building land, cottages and residence; land extends to about 280 acres. Auctioneers, 20, Hanover-sq., W.1.
London.—Knight, Frank & Rutley will sell in the Hanover-sq. Estate Room, Elmgate Gardens estate, comprising freehold building land, area about 14½ acres. Auctioneers, 20, Hanover-sq., W.1.

APRIL 19.

London.—Grant Stevenson & Co. will sell (unless previously disposed of by private treaty), at "The Compton Hall," Compton-rd., Wimbledon, in 14 lots, residence, stabling and 12 building plots. Auctioneers, Avispado House, Holland Park-av., W.11.
★**London.**—William Willett, on the premises, 72, Harrow-rd., W.2, and Porteus-yard, Porteus-rd., Harrow-rd., W.2. Builders' and contractors' plant and material. Auctioneers, William Willett, Ltd., Sloane-sq., S.W.1.

APRIL 21.

★**Leigh-on-Sea.**—H. W. Smith & Moon, in conjunction with W. H. Taylor & Son, *re* S. W. Powell, Ltd. In voluntary liquidation at the Hotel Victoria, The Broadway, Southend-on-Sea. Freehold corner building site known as Powell's Timber Yard. Auctioneers, W. H. T. & Son, 44, Alexandra-st., Southend; H. W. S. & M., 6, Great James-st., Bedford-row, W.C.1.

APRIL 24.

London.—Hampton & Sons, at St. James' Estate Rooms, 20, St. James'-sq., S.W.1. Freehold building estate at Potters Bar, Middlesex. Auctioneers, 20, St. James'-sq., S.W.1.

MAY.

Hastings.—Berryman & Gilkes. By order of the court. Residential estate, 4 bungalows, 6 cottages, etc., to be sold by auction or privately. Auctioneers, 2, Hans-rd., S.W.3.

MAY 1.

★**Surrey.**—King & Chasemore, at The Red Lion Hotel, Dorking (unless sold previously by private treaty). Leasehold business property known as The Mid-Surrey Lime Works, machinery, plant and equipment. Auctioneers, Richmond House, Horsham.

MAY 10.

Uxbridge.—Constable & Maude will sell, by direction of George Rose, Esq., in 28 lots, at the Chequers Hotel, Uxbridge (unless previously sold privately), portions of the Harefield-place estate, Middlesex, also mansion, in all about 700 acres. Auctioneers, 2, Mount-st., Grosvenor-sq., W.1.

Public Appointments.

APRIL 14.

★**Eastbourne.**—Temporary Clerk of Works required by the T.C., for erection of 54 brick houses. Major Leslie Roseveare, B.E.

APRIL 16.

London.—Visiting teachers required for two evenings weekly, one wood-carving, gesso and gilding (water and oil) for two afternoons and evenings weekly. Education Officer (T.1a), The County Hall, Westminster-bridge, S.E.1.

APRIL 17.

Bromley.—Building Inspector required by the Bromley R.D.C. Leonard O. Wall, Clerk, Council Offices, Crofton Pound-hill, Orpington.

APRIL 18.

★**Peterborough.**—Quantity Surveyors: Preparation of bills of quantities, etc., for new municipal buildings. W. H. A. Court, C.E. and S., Broadway.

APRIL 30.

London.—Temporary Architectural Assistant in dept. of the Chief Engineer of the Metro. Water Board. Henry E. Stilgoe, M.Inst.C.E. Offices of the Board, 173, Rosebery-av., E.C.1.

MAY 12.

★**London.**—Head of the Architectural, Bdg. and Sur. Dept., whole time or part time. W. M. Macbeth, Clerk to the Governors, Northern Polytechnic, Holloway, N.7.

NO DATE.

★**Federated Malay States.**—Tunnel Foremen (2) required for the Railway Department (Construction) for two years. Apply at once, Crown Agents for the Colonies, 4, Millbank, Westminster, S.W.1, quoting M/545/6.
★**Tanganyika.**—Inspector of Works required by the Government of Tanganyika Territory for the Public Works Dept. Crown Agents for the Colonies, 4, Millbank, S.W.1, quoting M/410.

A Correction.

In the plan and list of exhibitors at the Building Exhibition which we gave in our last issue we regret that the name of the Federated Employers' Insurance Association, Ltd., was incorrectly given.

PROPOSED NEW BUILDINGS & OTHER WORKS*

In these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works at the time of publication have been actually commenced. Abbreviations: T.C. for Town Council; U.D.C. for Urban District Council; R.D.C. for Rural District Council; E.C. for Education Committee; B.G. for Board of Guardians; B.C. for Borough Council; P.C. for Parish Council; M.H. for Ministry of Health; M.T. for Ministry of Transport; C.B. for County Borough; B. of E. for Board of Education; M.A.B. for Metropolitan Asylums Board; and M.W.B. for Metropolitan Water Board; Borough Surveyor, B.S.; Borough Engineer, B.E.; District Surveyor, D.S.; Clerk, C.; Town Clerk, T.C.; County Engineer, C.E.; County Surveyor, C.S.; County Architect, C.A.; Surveyor, S.; Engineer, E.; Borough Architect, B.A.; Architect, A.

Ashton-under-Lyne.—E.C. resolved that new elementary school be built in eastern area. Provision of a modern school in Heginbottom Technical School, Textile School and Mechanics' Institute Buildings is also under consideration.

Audenshaw. — U.D.C. passed plans:—eight houses, Droyladen-rd. and Asshetson-av., A J Franks.

Barking Town.—U.D.C. approved following schemes:—Longbridge-park: Convenience near Water-lane entrance for males and females, £150; and additions to existing women's and children's convenience adjoining tennis courts, £360; Vicarage-field: Temporary convenience for males and females, £100.

Barnoldswick.—E. Simpson & Sons, architects, 12, Cunliffe-terr., Manningham, Bradford, preparing plans for church at Gisburn-rd., for Fr. Theo van Woerkom.

Barnsley.—Barnsley Sports Club, Ltd., propose to construct a greyhound racing track at Queen's Grounds. Plans by H. B. Hobson, surveyor, 188, Oxford-rd., Manchester.

Batley.—Holton & Fox, architects, Corporation-st., Dewsbury, prepared plans for presbytery and alterations to Roman Catholic Church.

Beckenham.—Picture theatre with dance hall and a block of shops and flats is to be erected on site in the High-st. Plans by Robert Cromie, F.R.I.B.A., 73, Edgware-rd., W.2.

Billingham.—U.D.C. approved plans for 485 houses on site near Bellasis-lane, by Synthetic Ammonia and Nitrates, Ltd.—With regard to proposed erection by U.D.C. of municipal buildings, the Furness Shipbuilding Co. offered to sell two or three acres of land on west side of Nelson-av., Haverton Hill, and Council decided to communicate with company regarding price, and to instruct architects to prepare a large lay-out plan and a sketch plan of building.

Birmingham.—T.C. recommend that, subject to approval of M.H., transfer of 785 sq. yds. of land at Shaw Hill-rd. to Public Health Committee be agreed as a site for Child Welfare Centre.—Also subject to approval of M.H., offer of F. H. Crabbe to take approximately 3¾ acres of land at corner of Shirley-rd., and Olton Boulevard East, on building lease, be accepted.—Transfer of 173 sq. yds. of land forming part of the Foxhollies housing estate fronting to Olton Boulevard East, to Electric Supply Committee, as site for transformer station be approved.—Education Committee recommend, subject to approval of B. of E. and M.H., proposals for purchase of site and buildings of Severn-st. Council School, together with 666 sq. yds of adjoining land and houses thereon, be approved, and Finance Committee be instructed to borrow £7,800 required.—Also, subject to approval of B. of E. and M.H., proposed provision of new public elementary school at Yardley Wood be approved at £24,400.—E.C. also recommend, subject to approval of B. of E. and M.H., enlargement and improvement of Tilton-rd. Council school be approved, and application be made for £19,400.—Subject to approval of B. of E. and M.H., the proposed purchase of land at Handsworth as site for a special school been approved.—B. of E. and M.H. also being asked to approve compulsory purchase of piece of land situated between Alum Rock-rd., Burney-lane, and Stechford-lane, as site for secondary school.—Offer of F. W. Wheeldon to take on lease 3,150 sq. yds. of land at corner of Lordswood-rd and Woodville-rd., Harborne, as site for 5 houses, been accepted.

Blackpool.—C.B. resolved that Cleansing Committee be strongly recommended to enlarge existing public conveniences attached to cemetery, with entrances from Talbot-rd., in lieu of the proposed erection of new public conveniences.—Borough Electrical Engineer is to provide and erect on land adjacent to Rose Hill Laundry, near Handsworth-rd., transformer sub-station.—Borough Electrical Engineer has also been instructed to provide and erect on land adjacent to Norbreck Hydro a transformer sub-station.—Application is to be made to Electricity Commissioners for sanction to borrowing £48,000, for extension of electricity supply.—Council resolved that Estates and Housing Committee accept offer of land at corner of Waterloo-rd. and Fir-grove for erection of branch library.—Council are to accept offer of Blackpool Co-operative Society, Ltd., to dispose to Corporation of land in Bispham-rd.—Parishioners of South Shore Parish Church proposing to provide new vestries to their edifice. Plans by A. A. C. Moore, 19, Abingdon-st.—T.C. passed plans:—seven garages and outbuildings, Knowsley-av., Staunton Bros.; nine garages, Rosebery-av., Leach & Unsworth; business premises and shops, Anchorsholme-lane, E., W. Binns; Sunday-school and hall, Dean-st., Trustees of Holy Trinity Church; three houses, Vicarage-lane, Staunton Bros.; three houses, Boardman-av., R. L. Clark; six houses, Buckley-cres., —. Benyon; six houses and garages, Stonyhill-av., Booth & Shaw.

Bolton.—Board of Management of Infirmary are building X-ray department and are to take in hand building of new Haslam nursing home, for which Bradshaw, Gass & Hope, FF.R.I.B.A., 19, Silverwell-st., are architects.—E.C. have under consideration erection of technical school.—Wynne-Thomas & Button, architects, 14, Acresfield-st., are preparing plans for school at Castle-hill, for Corporation. Accommodation provides for 640 seniors and 450 infants and juniors.—Ormrod Pomeroy & Foy, FF.R.I.B.A., architects, 2, Acresfield, been appointed to prepare plans for Chorley Old-rd. Congregational Church new Sunday schools, at £9,000.—T.C. passed plans:—F. Draper, seven houses, Gregory-av.; J. W. Jones, two houses, Seddon Fold, Chorley Old-rd; J. Latham, three houses, Regent-rd.; Exors of Col. R. H. Ainsworth, streets and levels, off Knowsley-rd, and Bennett's-lane; Yates and Partington, 40 houses, off Knowsley-rd., and Bennetts-lane; Lord Bradford, streets and levels, off Clayton-st.; F. Morris, eight houses, off Clayton-st.; Leigh Bros., Ltd., eight houses, Crompton-way; Finance Committee, 96 houses, Quebec-st. estate; Turner Bros, six houses, Eldon-st.; A. H. Price, 11 houses, Sharples-av.

Bournemouth.—T.C. passed plans:—eight houses, Norton-rd., and Jameson-rd., H. Wilmott; three stores, rear of 46 and 48, Avon-rd., H. T. Hobern; four garages, Wyncombe-rd., A. Giles; seven houses, Clifton-rd., and Belle Vue-rd., A. F. Clarke & Sons; four houses, Ashton-rd., G. J. Lockhan & Son; four houses, Morden-rd., F. J. Marks.

Bradford.—T.C. received M.H. sanction to borrowing £8,092 for erection of working-class dwellings at Thornbury, Swain House and Lower Grange.

Bridlington.—T.C. passed plans for new chancel tower, vestries, and parish hall for vicar and churchwardens of Emmanuel Church.

Brookwood.—New reception wing to accommodate acute cases is to be added to Mental Hospital at £65,000.

Burnley.—Aspden & Johnson, 104, Manchester-rd., been appointed to prepare plans for reinstatement of Pendle View Mill, Cotton-st., owned by Nutall & Crook.

Cabra.—North Dublin R.D.C. received from the L.G. Ministry sanction for building of 10 labourers' cottages at Cabra and one at Killester.

Calcot.—Royal Berkshire Hospital propose to build branch hospital to hold some 60 beds, costing about £20,000. Plans by Charles Smith & Son, Friar-st., Reading.

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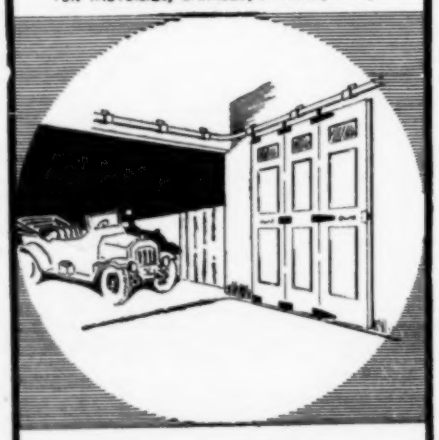

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Caterham.—U.D.C. passed plans: Cinema, Croydon-rd., L. Morris; 2 houses, Crescent-rd., Gladden and Bridle; 8 houses, Milton-rd., F. C. Smith.

Chelmsford.—T.C. instructed B.E. to visit B. of E. with sketch plan of proposed new school in Lady-lane, and that Board be asked to give approval to scheme for providing school for 890 scholars.

Chertsey.—U.D.C. are considering scheme for another 100 houses.

Chesterfield.—S. H. Ward & Co., Ltd., brewers, Sheffield, proposing to erect hotel on site at Stand-rd., Newbold Moor. Plans by Gibbs, Flockton & Gibbs, FF.R.I.B.A., 15, St. James's-st., Sheffield.—T.C. recommend that Town Clerk apply to M.H. for sanction to borrow £1,448 for construction of railway siding at Highway depot.

Clacton.—U.D.C. received sanction of M.H. to borrowing of £37,000 for erection of municipal offices. Sir Brumwell Thomas, architect.

Clitheroe.—B.S. been instructed to prepare plans and estimates for bandstand at the Castle.

Colne.—Conservative Club acquired premises in Ninevah-st. for new headquarters. R. S. Pilling, Colne-lane, architect for structural alterations.—T.C. instructed B.S. to prepare plans for further erection of houses in Laneshaw Bridge district.

Coulsdon and Purley.—U.D.C. passed plans: Gridrah Estates, Ltd., 2 semi-detached houses, Brancaster-lane, Purley; H. Hemmings, Ltd., 2 detached houses, Bramley-av., Coulsdon; T. Barden, 2 detached houses, Coulsdon-rise, Coulsdon; Chester & Hopkins, 4 detached houses, Warwick-rd., Coulsdon; C. L. G. Morgan, 6 semi-detached houses, Clifton-rd., Coulsdon; R. Costain & Sons, 26 houses (semi-detached), Littleheath-rd. and Brent-rd., Selsdon; E. O'Sullivan, Ltd., 4 semi-detached houses, Beverley-rd., Kenley; A. T. Bate, 7 detached houses, Verulam-av., Purley; Mrs. Chapman, 2 semi-detached houses, Woodcote-grove-rd., Coulsdon; A. H. Jones, 8 semi-detached houses, Portnalls-rise, Coulsdon; Coulsdon Heights Estate Co., revised plan of new streets, Coulsdon Heights Estate, Coulsdon; Chas. Lewin, 5 detached houses and garages, Riddlesdown-rd., Purley; Chas. Lewin, 6 detached houses and garages, Riddlesdown-rd., Purley.

Coventry.—National Provincial Bank, Ltd., purchased site in centre of city, where they propose to build branch.

Crayford.—M.H. sanctioned application by Council for scheme for 130 houses on Iron Mill-lane site. Tenders are being invited.

Darlington.—T.C. received sanction to borrow £26,000 for extensions to retort house and coal-handling plant at gasworks.

Dartford.—M.A.B. recommend that approval be given to expenditure of £113 10s. on alterations and improvements to cow shed at Joyce Green Hospital.

Dolgelley.—Management committee of Dolgelley and Barmouth District Cottage Hospital decided to commence building operations forthwith.

Doncaster.—Board of Management Sub-committee instructed building committee of Doncaster new Infirmary to proceed with erection of first block, which will provide accommodation for 120 beds at £100,000.

Easington.—R.D.C. is to make application to M.H. for sanction to borrow money for further 70 houses.

Eastbourne.—B.E. and sub-committee been requested to submit to T.C. amended scheme for developing Redoubt site as a concert and recreative centre.—It is proposed to add Turkish baths to Devonshire Baths, now owned by municipality. Including certain other improvements, outlay is estimated at £12,000.—Alternative schemes for coastal road between Eastbourne and Hastings, via Pevensey Bay and Bexhill, been considered by T.C. Estimated cost of one approved is £197,000. Been decided to widen road to Beachy Head.

East Ham.—T.C. approved temporary additional accommodation for diphtheria patients at Isolation Hospital, and also permanent extensions.—Town Clerk is to report with reference to vacant land bounded by Napier-rd., Talbot-rd., and Market-st.—Council are to purchase land in Sixth-av. and Church-rd. for building purposes.—Plans passed:—sixteen lock-up shops, Green-st., between St. Stephen's Church and Shaftesbury-rd. (St. George-in-the-East School site), G. Coles, F.R.I.B.A.; cinema, St. George-in-the-East School site, Green-st., G. Coles, F.R.I.B.A.; lay-out for 44 houses, Shaftesbury-rd. and Dorset-rd., H. W. Binns; steel-framed structure, Hall's laundry, Church-rd., G. N. Kent.

Epworth.—Parochial Church Council propose repairing Parish Church.

Gateshead.—Newcastle Presbytery have had prepared plans for church.

Guildford.—T.C. passed plans for seven houses, Worplesdon-rd., for R. C. Whitemore.

Hatfield.—R.D.C. decided to purchase from Lord Cranborne site for new Council offices, subject to consent of M. of H.

Hayes.—U.D.C. passed plans:—14 houses, Wood End Green, for G. Salter; 32 houses, Bedford-av. (north), G. Neal; 2 shops and 3 lock-up shops, Hewens-corner, Uxbridge-rd., G. Brooks; extensions to hall, Nield-rd., Botwell Brotherhood; extensions to "The Limes," Park-rd., A. H. Boot.

Kingston.—Scheme for extending County Hall, at £103,500, been recommended to Surrey C.C. Scheme been prepared by E. Vincent Harris, 29, St. James's-sq., London.

Kingston-on-Thames.—Messrs. Bentalls, Ltd., are proposing to carry out several important rebuilding schemes at their showrooms. Plans have been prepared by Carter and Young, Eden-st.

Kirkham.—Fylde B.G. proposing extensions to infirmary.

Leeds.—T.C. received letter from the Superintendent of Cleansing with respect to repairs re-

* See also our List of Contracts, Competitions, etc.

quired to farm buildings, at Thorpe Stapleton, and resolved that instructions for carrying out repairs be given.—Sanction been received from M.H. to borrowing £15,211 for erection of Elementary School in Bentley-lane, Meanwood, and £1,239 for furniture and fittings thereat.—Question of applying to M.H. for sanction borrow £2,750 for reconstruction of bridge and other works in connection with improvement of Wood-lane and Pudsey-rd., been referred to Finance and Parliamentary Committee.—Council resolved that plan submitted by Health Committee for construction of sunken conveniences for women in forecourt of Tuberculosis Dispensary, New Briggate, be approved.—Baths Superintendent and City Engineer prepare scheme for utilisation for baths purposes of vacant land and dilapidated property adjoining Kirkstall-rd. baths.—Additional bedroom and bathroom is to be provided at Hall Farm, Blubberhouses, at £110.—Mr. R. Knight offered to sell to Corporation land in Cross Green-lane, Halton, as site for erection of public buildings.—Application of Electricity Department for permission to erect a sub-station and lay cables across land on Chapeltown Barracks estate been sanctioned.—T.C. passed plans:—J. Greenwood, four semi-detached houses, Stanmore-cres., Burley; M. Bristow, ten semi-detached houses, Wensley-rd., Chapel-Allerton; A. Gibbs & Sons, four semi-detached houses, Park Spring-gdns., Bramley; J. Carlton, four semi-detached houses, Parkland-cres., off Stonegate-rd.; W. Jowitt, sixteen houses, Rookwood-av., York-rd.; H. Hick, four semi-detached houses, Gipton Wood Place, Harehills; H. Broadbent, ten semi-detached houses, Stainbeck-lane; W. Ripley & Sons, Ltd., 22 semi-detached houses, Burley Hill and Woodside View.

Leyton.—T.C. passed plans:—J. & J. Dean, 4 shops with houses over at High-rd., Leyton; S. A. S. Yeo, alterations and additions at "Lion and Key" P.H., 475, High-rd., Leyton; D. Freeder & Co., new factory buildings rear of existing premises at Lea Bridge-rd.; J. A. Dartnall, 6 shops with dwelling accommodation over at 745, High-rd., Leytonstone.

Liverpool.—The City Council propose police and fire station with 24 staff houses at "Roseland," Mossley Hill, at £53,000. Plans by Land Steward and Surveyor's Office, Municipal Buildings, Dale-st.

London.—M.A.B. recommend, subject to sanction of M.H., provision, at £233 10s., of accommodation for storage of milk and cleansing of milk vessels at Princess Mary's Hospital for Children be approved.—Also, subject to assent of M.H., extension, at £582 10s., of verandah floor of ward block A be approved.

London (Fulham).—M.A.B. received approval to erection of new nurses' block on site of temporary ward No. 8 and carrying out of incidental re-arrangements at Western Hospital.

London (Hackney).—L.C.C. recommend borrowing by B.C. of £62,940 for housing purposes within the borough.—B.C. recommend proposals of L.C.C. for establishment of open-air swimming bath on Hackney Downs at £5,000.

London (Hendon).—M.A.B. recommend, at £121, alterations to steward's house at Colindale Hospital.

London (Lambeth).—B.C. received M.H. sanction to borrowing £2,119 for conversion of Tate (Central) Library to Open Access System.

London (Lewisham).—B.C. passed plans:—J. Harrison & Co., additional temporary school, Burnt Ash-hill; J. G. Stephenson, for L.C.C., 116 houses on Downham estate; Walker, Clinging & Co., 10 houses, Warren-av.; Thomas Cook & Son., Ltd., sports pavilion, Crabb-hill; Wm. Wilmot, Ltd., 5 houses, Boveney-rd.

London (New Cross).—M.A.B. received Ministry approval to additional isolation accommodation at the South-Eastern Hospital.

London (Spitalfields).—Plans being prepared by Central Markets Committee of City Corporation for block of buildings at Spitalfields Market.

Long Reach.—M.H. approved tender of Wilson, Lovatt & Sons, for reconstruction of Long Reach Hospital, at £62,662, for M.A.B.

Lowestoft.—M.A.B. received M.H. sanction to £123 for provision of bathing accommodation for girls at S. Anne's Home.

Luton.—T.C. passed plans:—G. Day & Sons, 4 houses, Talbot-rd.; J. T. Garrett, 7 houses, Alton-rd.; Duberly & White, alterations and additions 3-5, George-st.; Sanders & Brightman, alterations and additions 37, Bute-st.; J. Frost, 15 houses; G. Hammett, 4 houses, house and shop, Dallow-rd.; S. W. Johnson, 5 houses; Douglas-rd.; E. G. Bell, 6 houses, Selbourne-rd.

Manchester.—City Council approved Wythenshawe Estate Special Committee's request to endorse application to M.H. for sanction to borrow £200,000 for purchase of further plots of land in Wythenshawe area.—Montague Burton, Ltd., Hunslet-rd. Mills, Leeds, acquired site at junction of Thornton-st. and Ashton Old-rd., Openshaw, where they propose to erect branch premises. Plans by H. Wilson, architect and surveyor, 81, North-lane, Roundhey, Leeds.—W. Thornley, L.R.I.B.A., Wallgate, Wigan, is preparing plans for cinema at York-st., Hulme, for Tommy Royle.—E. B. Jones & Rawlinson, Ltd., 11, Cannon-st., Salford, have acquired site on Bowker Vale estate, Crumpsall, for 67 houses. Plans by Drury & Gomersall, Imperial Buildings, Oxford-st.—T. W. Boardman, builder, 72, Church-st., Newton Heath, is to erect 40 houses off Crumpsall-lane. Plans by G. C. Roberts, Huntley-rd., Crumpsall.

March.—U.D.C. have approved conditionally plans for theatre for March Amusements, Ltd.

Middlesbrough.—North Riding Infirmary Board of Governors decided to carry out extensions to institution at £9,000.

Milton.—Plans deposited by E. J. Smith for ten houses in Rock-rd., been passed by U.D.C.

Neston.—Site been secured in Liverpool-rd. for 40 bungalows to be erected by U.D.C. and Social Service Council.

Newcastle-under-Lyme. — Plans passed:—six houses, Maddock Bros., Hill Farm estate.

Northampton.—C.B. inviting tenders for internal painting at Cattle Market-rd. baths.—B.E. is to submit scheme for enlargement of Harbrough-rd. hospital.—Plans passed: two shops and reconstruction of offices, 65, Abington-st., J. Ball & Sons; two houses, Kettering-rd., C. H. Rainbow; rebuilding, "The Red House," Weedon-rd., P. Phipps & Co., Ltd.; seven lock-up garages, South-st., —. Shrewsbury; abattoirs, off Ransome-rd., Co-operative Wholesale Society, Ltd.; four houses, Forfar-st., S. G. Sale & Co.; warehouse, The Riding, Slade's Stores; alterations and additions, "Green Tree" Inn, The Green, P. Phipps & Co., Ltd.; new bakehouse and garage, and additions to living accommodation, 44 and 46 ("The Tavern"), Upper Harding-st., P. Phipps & Co., Ltd.

Nottingham.—New lay-out for Nottingham Market-place, to cost £24,000 with an additional £3,750 for street works, been approved by City Council.

Preston.—B.S. been instructed by Health Committee to advertise for tenders for extending administrative block of Isolation Hospital. E.C. recommend public notice be given of intention of Council to provide a new elementary school on land situate on north side of Great Shaw-st.

Pudsey.—Plans been approved for warehouse at Troydale Mills for W. C. Gaunt. Architect, P. T. Runton, Bradford.

Rotherham.—T.C. proposed to ask permission of Ministry to invite tenders for erection of 276 houses, total cost, including roads and sewers, being estimated at £113,220.—Vicar, Rev. H. R. Eberson, and congregation of Parish Church, Maltby, near Rotherham, are proposing to erect new parochial hall.—It is proposed to erect new Mission Church for St. James Clifton, at £5,000. Plans by J. E. Knight, architect, 48, Moorgate.

BUILDING RESEARCH.

(*Concluded from page* 632.)

short but continuous lintol beams into one long beam—a purpose for which it was not designed. In this case we had the introduction into building work of a new constructional material and method. An essential structural feature was made of a portion of a wall, and through lack of knowledge of modern theory of structures, men's lives might be endangered. The necessary knowledge was already in existence. We had not to wait for further research—yet the builder was not using it. A new material was being used which could not be handled by traditional methods. A consideration of these three accidents made it clear, said the lecturer, how urgent was the need for higher education in the building industry, and in conclusion he wished to summarise what was the present position of training in the building industry.

The personnel engaged could be considered as divided into three classes (*a*) the craftsman, (*b*) the building supervisor, (*c*) the professional man (architect and engineer).

(*a*) *The Craftsman* was trained by a period of apprenticeship together, in the best cases, with a period of technical school training in the science of his craft. The primary object the whole time was to develop a man skilled in the use of his hands. Virtually that meant a request to the craftsman only to think in terms of craft skill and to leave the larger problems of construction to those organising his labour. (*b*) *The Building Supervisor.*—By this term was meant the master builder, general foreman, etc., who had the organising of the craftsmen. The training of this group was very haphazard in England. Probably the best types were those who had served as craftsmen and then shown special capabilities for organisation, etc., and had thus been given the wider work. The less efficient types had received no training other than that of a builder's office, starting may be, as office boys and viewing the whole problem of building construction and craft organisation purely as one of £ s. d. Of course, we all knew exceptions to these rather sweeping generalisations, but it would be agreed that the picture suggested was generally true. In the lecturer's opinion one of the most serious causes of trouble in the industry at the present day was in the lack of real training for that group of building supervisors. (*c*) *The Professional Man* (architect and engineer).—With the passage of time, as already indicated, the designer of buildings gradually became divorced from actual craft experience and study. He had become more highly trained as an artist and interpreter of the requirements of his client in terms of general layout, etc. When problems arose involving structural strength, he called in the structural engineer, but here also was met a man who often possessed very narrow training when viewed from the standpoint of building. The structural engineer was a specialist in stress calculations for the employment of materials which obeyed Hook's Law, but the builder had to use very many materials which did not allow of such mathematical analysis, and because of this rather specialised training of the engineer, and the lack of any appreciable scientific training for the architect and building supervisor, many of the troubles of to-day arose. Such was a brief summary of the conditions of training of the personnel of the building industry. We were training our craftsmen and asking them to specialise on craft skill. We introduced new materials and new methods where no craft skill had been developed. Then we organised our craftsmen by means of supervisors, who in most cases had no more advanced scientific training than the craftsmen themselves. Had the time not come, asked the lecturer, when insistence should be made upon the better and more scientific training of the building supervisor? Could we afford the loss in efficiency to the community?

From his own standpoint he felt this very strongly. He admitted their work at the Building Research Station brought them into contact with an abnormal number of failures in practice, and that of necessity coloured his outlook. But the fact remained that very many of those accidents could be foreseen and possibly prevented if even the existing scientific knowledge of materials and methods of construction formed part of the normal training of the building supervisor. Such higher education was also quite essential if full advantage was to be taken of the research work now in progress. Could we get a standard of education for the builder at least equivalent to the University training provided for the engineer? He hoped so, for only by such provision was there real hope for improved efficiency and more economical construction.

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GOOD BUILDING DEAL.

Inches.	per stan.	Inches.	per stan.
4 × 11	£30 0	3 × 6	£21 0
4 × 9	26 0	3 × 11	25 0
4 × 8	25 0	2 × 11	26 0
4 × 7	23 0	3 × 9	24 0
3 × 8	22 0	2½ × 9	24 0
3 × 7	22 0	3 × 4½	21 0
2½ × 7	21 0	3 × 4	21 0

PLANED BOARDS.

1 × 11	£30 0	1 × 9	£28 0

PLAIN EDGE FLOORING.

Inches.	per sq.	Inches.	per sq.
¾	18/-	1¼	30/-
⅞	21/-	1½	34/-
1	24/-		

TONGUED AND GROOVED FLOORING

Inches.	per sq.
1	24/-
1¼	30/-
1½	34/-

MATCHING (BEST).

Inches.	per sq.
¾	16/6
¾	19/-
1	24/-

Ins. BATTENS.	s. d.
¾ × 2 ... per 100 ft.	2 6

SAWN LATHS.	s. d.
Per bundle	2 6

1" AND UP THICK.

	£ s. d.	£ s. d.
Dry Austrian Wainscot, per ft. cube	0 16 0	to 0 18 0
Dry American and/or Japanese Figured Oak, ft. cube	0 14 0	to 0 15 0
Dry American and/or Japanese Plain Oak, ft. cube	0 10 0	to 0 13 0
Dry sq. edged Honduras Mahogany, ft. cube	0 15 0	to 0 18 0
Dry Log cut Honduras Mahogany, ft. cube	0 16 0	to 1 1 0
Dry Cuba Mahogany, ft. cube	1 1 0	to 1 10 0
Dry Teak, ft. cube	0 13 0	to 0 15 0
Dry American Whitewood, ft. cube	0 10 0	to 0 14 0
Best Scotch Glue, per cwt.	4 10 0	to —
Liquid Glue, per cwt.	4 7 0	to 5 10 0

SLATES.

First quality slates from Bangor or Portmadoc carriage paid in full truck loads to London Rate Station. Per 1,000.

	£ s. d.		£ s. d.
24 by 12	32 18 4	18 by 10	18 12 11
22 by 12	29 17 11	18 by 9	16 9 2
22 by 11	27 14 2	16 by 10	15 12 6
20 by 12	26 5 0	16 by 8	12 3 9
20 by 10	22 10 0		

TILES.

Delivered at London rate stations in full truckloads of not less than 6 tons. Per 1,000. f.o.r. London.

Best machine-made tiles from Broseley or Staffordshire district	5 7 6
ditto hand-made ditto	5 17 6
Ornamental ditto	6 2 6
Hip and valley tiles (per dozen) Hand-made	0 9 6
Hip and valley tiles (per dozen) Machine-made	0 9 0

METALS.

Joists, Girders, &c., to London Station, per Ton—

	£ s. d.
R.S. Joists, cut and fitted	12 10 0
Plain Compound Girders	14 10 0
" Stanchions	16 10 0
In Roof Work	19 10 0

Mild Steel Rounds.—To London Station, per ton

Diameter.	£ s. d.	Diameter.	£ s. d.
¼ in.	12 0 0	⅜ in. to ½ in.	10 15 0
⅝ in.	11 0 0	⅝ in. to 2½ in.	10 10 0

Wrought-Iron Tubes and Fittings—

(Discount off List for lot of not less than £7 net value delivered direct from Works, 2½ per cent. less above gross discounts, carriage forward, if sent from London Stocks.)

	Tubes. Wrought Mild Steel.	Tubes. Genuine Staffs. Iron.	Fittings. ½ in. and under.	Fittings. Over ½ in.	Flanges. ½ in. and under.	Flanges. Over ½ in.
	%	%	%	%	%	%
Gas	67½	50	42½	45	52½	55
Water	63½	46½	37½	40	47½	50
Steam	60	42½	32½	35	42½	45
Galv. gas	55	37½	32½	35	42½	45
Galv. water	50	32½	27½	30	37½	40
Galv. steam	45	27½	22½	25	32½	35

C.I.—Half-Round Gutters—London Prices ex Works

Per yd. in 6 ft. lengths.	Gutters.	Angles and Nozzles.	Stop Ends.
3 in.	1/3½	11½d.	3½d.
3½ in.	1/4½	1/1½	3½d.
4 in.	1/6	1/3	3½d.
4½ in.	1/7½	1/4½	4½d.
5 in.	1/10½	1/6½	5½d.

O.G. Gutters.

3 in.	1/8	1/4½	3½d.
3½ in.	1/8	1/4½	3½d.
4 in.	1/9½	1/4½	3½d.
4½ in.	1/11½	1/7½	4½d.
5 in.	2/4½	1/10½	5½d.

Rain-Water Pipes, &c.

per yd. in 6 fts.	Pipe.	Bends, stock angles.	Branches, stock angles.
2 in. plain	1/10½	1/3	1/9½
2½ in. "	2/0½	1/4½	2/1½
3 in. "	2/6	1/9	2/7½
3½ in. "	2/11½	2/0½	3/0½
4 in. "	3/5	2/6½	3/8½

L.C.C. Coated Soil Pipes—London Prices ex Works.

	Pipe. s. d.	Bends, stock angles. s. d.	Branches, stock angles. s. d.
2 in. per yd. in 6 fts. plain	3 3	2 4½	2 10
2½ in. "	3 9	2 7½	3 7
3 in. "	4 6	2 10	4 2½
3½ in. "	4 11½	3 7	4 11½
4 in. "	5 5½	4 0½	5 9

L.C.C. Coated Drain Pipes—London Prices ex Works

	Pipe. s. d.	Bends, stock angles. s. d.	Branches, stock angles. s. d.
3 in. per yd. in 9 ft. lengths	4 4	5 1	8 0½
4 in. " "	6 2	5 8	10 0
5 in. " "	7 2	10 10	17 1
6 in. " "	8 6	13 2	21 9

Gasken for jointing, 38/6 per cwt.

Iron—	Per ton in London. £ s. d.		£ s. d.
Common bars	13 0 0	to	14 10 0
Staffordshire Crown Bars— Good merchant quality	14 5 0	to	15 15 0
Staffordshire Marked Bars	16 5 0	..	17 5 0
Mild Steel Bars	10 0 0	..	11 0 0
Steel Bars, Ferro-Concrete quality, basis price	10 0 0	..	11 0 0
Hoop iron, basis price	12 0 0	..	13 0 0
" Galvanised	27 0 0	..	28 0 0
Soft Steel Sheets, Black— Ordinary sizes, to 20 g.	13 5 0	..	14 5 0
" " " 24 g.	14 5 0	..	15 5 0
" " " 26 g.	16 5 0	..	17 5 0
Sheets Flat Best Soft Steel, C.R. and C.A. quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15 10 0	..	16 10 0
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 22 g. and 24 g.	16 10 0	..	17 10 0
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 26 g.	18 10 0	..	20 10 0

No. 1 quality £4 per ton extra.

Flat and Galvanised Corrugated Sheets— Ordinary sizes, 6 ft. to 9 ft. to 20 g.	18 0 0	..	19 0 0
Ordinary sizes, 6 ft. to 9 ft. to 22 g. and 24 g.	18 10 0	..	19 10 0
Ordinary sizes, 6 ft. to 9 ft. to 26 g.	21 10 0	..	22 10 0
Sheets Galvanised Flat, Best quality— Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	22 0 0	..	23 0 0
Best Soft Steel Sheets, 22 g. and 24 g.	24 0 0	..	26 0 0
Best Soft Steel Sheets, 26 g.	25 10 0	..	26 10 0
Cut Nails, 3 in. to 6 in.	19 0 0		

(Under 3 in. usual trade extras.)

Metal Windows.—Standard sizes, suitable for complete houses, including all fittings, painting two coats, and delivery to job, average price about 1s. 4d. to 1s. 7d. per foot super.

LEAD, &c.

(Delivered in London.)

	£ s. d.
Lead—Sheet, English, 4 lb. and up	28 0 0
Pipe in coils	28 10 0
Soil pipe	31 10 0
Compo pipe	32 10 0

Note.—Country delivery, 20s. per ton extra; lots under 3 cwt. 3s. per cwt. extra, and over 3 cwt. and under 5 cwt., 1s. 6d. per cwt. extra. Cut to sizes. 5s. cwt. extra.

Oil lead, ex London area, at Mills per ton	18 5 0

COPPER.

	s. d.
Seamless Copper tubes (basis) per lb.	1 1
Strong sheet "	1 0
Thin "	1 1
Copper nails "	2 3
Copper wire "	2 4

PLUMBERS' BRASS WORK.

Delivered in London.

New River Pattern Screw Down Bib Cocks for Iron.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
29/-	45/-	76/-	153/-	246/-	510/- per doz.

New River Pattern Screw Down Stop Cocks and Unions.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
41/6	62/-	92/-	174/-	300/-	588/- per doz.

River Pattern Screw Down Main Ferrules.

½ in.	¾ in.	1 in.
39/6	60/-	116/6 per doz.

Caps and Screws.

1¼ in.	1½ in.	2 in.	3 in.	3½ in.	4 in.
7/6	10/-	14/-	23/-	30/-	42/- per doz.

Double Nut Boiler Screws.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
7/6	11/-	17/-	20/-	36/-	63/- per doz.

Brass Sleeves.

1¼ in.	2 in.	3 in.	3½ in.	4 in.
10/-	12/-	20/-	24/-	31/- per doz.

New River Pattern Croydon Ball Valves, S.F.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.
35/-	56/-	98/-	162/-	228/- per doz.

Drawn Lead P. & S. Traps with Brass Cleaning Screw.

1¼ in.	1½ in.	2 in.	3 in.	
8 lbs. P. traps	33/-	41/-	56/-	101/- per doz.
8 lbs. S. traps	35/-	45/-	66/-	126/- "

Tin.—English Ingots, 3/1 per lb. Solder.—Plumber's 1/3, Tinmen's 1/6, Blowpipe 1/7 per lb.

PAINTS, &c.

			s. d.
Raw Linseed Oil,	in pipes	per gallon	0 2 11
" " "	in barrels ..	"	0 3 1
" " "	in drums ..	"	0 3 3
Boiled " "	in barrels ..	"	0 3 3
" " "	in drums ..	"	0 3 6
Turpentine	in barrels	"	0 3 10
"	in drums (10 galls.)	"	0 4 0
Genuine Ground English White Lead, per ton (In not less than 5-cwt. casks.)			50 0 0

* The information given on this page has been specially compiled for The Builder, and is copyright. The aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information

PRICES CURRENT OF MATERIALS (*contd.*)

PAINTS, &c. (*contd.*)

		£	s.	d.
Genuine White Lead Paint—"Father Thames," "Nine Elms," "Park," "Supremus," "St. Paul's," "Morganswyte," "Polacco," "J." Brand, and other best brands (in 14 lb. tins) not less than 5 cwt. lots	per ton delivered	68	10	0
Red Lead, Dry (packages extra)	per ton	38	10	0
Best Linseed Oil Putty	per cwt.	0	15	0
Filicol	"	0	15	6
Size. XD quality	ffkn.	0	3	6

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

	Per ft.		Per ft.
15 oz. fourths	2½d.	32 oz. fourths	6½d.
15 ,, thirds	3½d.	32 ,, thirds	8½d.
21 ,, fourths	3½d.	Obscured Sheet, 15 oz.	3½d.
21 ,, thirds	4½d.	,, ,, 21 ,,	4½d.
26 ,, fourths	4½d.	Fluted 15oz.	6½d., 21oz. 9d.
26 ,, thirds	6½d.	En'lled 15 oz.	4½d., 21oz. 6½d.

Extra price according to size and substance for squares cut from stock.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

	Per ft.
⅛ Rolled plate	4½d.
1/16 Rough rolled	5½d.
¼ Rough rolled	5½d.
Figured Rolled, Baltic, Oceanic, Arctic Stippolyte, and small and large Flemish White	5½d
Ditto, tinted	8½d.
Rolled Sheet	4½d.
White Rolled Cathedral	4½d.
Tinted do.	6½d.

Cast plate is same price as rough rolled.

VARNISHES, &c.

		Per Gallon £	s.	d.
Oak Varnish	Outside	0	14	0
Fine ditto	ditto	0	16	0
Fine Copal	ditto	0	18	0
Pale Copal	ditto	1	0	0
Pale Copal Carriage	ditto	1	4	0
Best ditto	ditto	1	12	0
Floor Varnish	Inside	0	18	0
Fine Pale Paper	ditto	0	18	0
Fine Copal Cabinet	ditto	1	2	6
Fine Copal Flatting	ditto	1	0	6
Hard Drying Oak	ditto	0	18	0
Fine Hard Drying Oak	ditto	0	19	0
Fine Copal Varnish	ditto	1	0	0
Pale ditto	ditto	1	2	0
Best ditto	ditto	1	12	0
Best Japan Gold Size		0	12	6
Best Black Japan		0	10	6
Oak and Mahogany Stain (water)		0	12	0
Brunswick Black		0	7	6
Berlin Black		0	14	6
Knotting (patent)		1	5	0
French and Brush Polish		0	17	0
Liquid Dryers in Terebine		0	9	0
Cuirass Black Enamel		0	7	0

Town Planning.

The following record of town-planning progress in England and Wales for the month ended February 29 is issued by the Town Planning Department, Ministry of Health :—

Preliminary statement approved (Stage BB).

Yorkshire (West Riding) : Hunslet R.D.C. (Oulton-with-Woodlesford Nos. 1 and 2).

Preliminary statements received (Stage B).

Derby : Shardlow R.D.C.

Devon : Torquay T.C. (No. 5).

Lancashire : Gt. Crosby U.D.C. (Nos. 2 and 3).

London : London C.C. (No. 7).

Middlesex : Friern Barnet U.D.C.

Northumberland : Newcastle-on-Tyne T.C. (Western area).

Nottingham : Hucknall U.D.C.

Warwickshire : Stratford-upon-Avon T.C.

Worcestershire : Oldbury U.D.C. (two areas).

Yorkshire (West Riding) : Selby U.D.C.

Resolutions received (Stage A).

Durham : Felling U.D.C.

Kent : Bromley T.C.; Canterbury T.C. (special area).

Middlesex : Enfield U.D.C.; Finchley U.D.C. (No. 2 extension); Southgate U.D.C. (Enfield U.D.C.); Teddington U.D.C.; Wembley U.D.C. (No. 3)

Surrey : Chertsey U.D.C.; Woking U.D.C.

Sussex : Eastbourne T.C. (No. 2); Eastbourne R.D.C.; Newhaven R.D.C.

Yorkshire (West Riding) : Greasborough U.D.C.; Kiveton Park R.D.C.; Maltby U.D.C.; Rawmarsh U.D.C.; Rotherham T.C.; Swinton U.D.C.; Wath-upon-Dearne U.D.C.

Warwickshire : Alcester R.D.C.; Solihull R.D.C.

NEW BUILDINGS IN SCOTLAND

Galashiels.—Extensions.—At the annual meeting of subscribers to Galashiels Cottage Hospital, suggestions were made with regard to extensions to the hospital.

Kirkcaldy. — Housing. — The Kirkcaldy District Committee has agreed to proceed with the building of 18 houses at Kennoway, 16 houses at Lochore, and a like number at Lumphinnans.

Montrose.—Bridge.—The contract for the erection of the new road bridge over the Southesk at Montrose has been placed with Sir R. M'Alpine & Son, Ltd. The price of the tender is £54,319 10s. 6d.

St. Andrews. — Shelters. — The Town Council has agreed to erect a shelter with 16 cubicles for the accommodation of bathers at the Step Rock at an estimated cost of £600.

Aberdeen.—Hospital.—Land at Foresterhill and Burnside, Aberdeen, extending to about 66 acres and belonging to Aberdeen Town Council, has been purchased on behalf of the Corporation of the Royal Infirmary, the Royal Asylum and the University Court of Aberdeen University, jointly.

Lennox.—Castle.—Intimation has been made at a meeting of Glasgow Parish Council that the negotiations for the purchase of Lennox Castle are now completed.

Motherwell.—Houses.—The Dean of Guild Court of Motherwell and Wishaw have sanctioned plans for the erection by the Motherwell and Wishaw Town Council of 80 houses—40 for Motherwell and 40 for Wishaw. Messrs. J. T. M'Donald, motor builders, Wishaw, were also granted warrant for workshop reconstruction, erection of showrooms, and the conversion of several old cottages into motor lock-ups at the corner of Stewarton-street, Wishaw.

Dundee.—Building.—Plans have been submitted to a meeting of the Works Committee of Dundee Town Council on behalf of Mr. John Pearson, solicitor, to whom the ground forming the east side of the Caird Hall square had been provisionally feued. The plans showed buildings with glass frontage in place of stone pillars.

Glasgow.—Housing.—The Statute Labour Committee of the Glasgow Corporation has requested the Town Clerk and the Master of Works to prepare a draft of a town-planning scheme for the eastern area of the city. The area extends to 3,400 acres, of which 800 acres are to be reserved for the erection of 13,000 houses.

Aberdeen.—Houses.—Plans for the erection of nine houses and for alterations to existing buildings at a cost of £25,951 were passed by the Plans Committee of Aberdeen Town Council.

Hawick.—Home.—In connection with the proposal to establish a maternity home in Hawick, Mr. Douglas Oliver has offered to Hawick Town Council the residence of Thornwood for £2,000.

Stornoway.—Houses.—The Town Council are to erect 20 houses on a site in Plantation-road. Tenders are now being invited.

Rhins.—Roads.—The Rhins District Committee of the Wigtownshire County Council has approved the road estimates at £32,095. Expenditure is provided for the widening of bridges near Cairnryan, on the Glasgow-road, and for building sea walls in the same district, where the surveyor, Mr. W. K. Gibson, had reported that coast erosion had taken place.

West Perthshire.—Housing.—The West Perthshire District Committee has sanctioned closing orders for the existing houses at Monemore.

Stirling.—Police Station. — The Town Council are inviting tenders for the erection of new police station at Spittal-street, Stirling. Mr. A. H. Goudie, Burgh Engineer, has prepared the plans.

AN OLD-ESTABLISHED IRONMONGERY FIRM

This year marks the commencement of a second century in progress of a very old-established firm of ironmongers in the City of London, Messrs. Clark, Hunt and Co., Ltd., of Shoreditch, E.1. Founded in 1828 by Mr. Henry Clark as a little cabinet ironmonger's shop, the business has grown out of all recognition. The present vast showrooms and warehouses can supply on demand anything and everything that the builder and contractor may require Showrooms are given over to the display of gas and electric fittings and accessories, as shades, pendants, wires, cables, vacuum cleaners, heating stoves, cookers, kettles, etc., while a special feature is made of tiled fireplaces, both for gas and coal fires. Lavatory equipment, wash basins, sanitary ware, baths—porcelain, enamelled iron, etc.—mirrors, etc., are also to be found in great display.

Engineers' tools—hoisting apparatus, wrenches, drills, furnaces, blow-lamps down to hammerheads and axes—are stocked in profusion, while the architect will find many examples of general and constructional iron work to his liking. Verandah railing, grilles, shopguards, gates, ladders and guard rails, rod principals, etc., are always in stock or can, if necessary, be made to order by the firm's well-equipped plant. Messrs. Clark, Hunt and Co., Ltd., keep an efficient permanent staff of experienced erectors for the erection of railings and gates, escape and service staircases, ladders, grilles, lanterns, etc.

A special department deals with heating systems. Low pressure hot water installations, pump or gravity domestic hot-water supply, Plenum or external systems of ventilation, drying or cooking by steam, dust extracting plant, etc., etc., are all dealt with in finished and satisfactory style by this department.

A complete list of this firm's specialities is impossible to give, but builders' brass-foundry and general castings, and iron and steelwork—bars, angles, joists, corrugated sheets—may, among others, be mentioned.

Some idea of the size of the premises may have been gained from this brief description of the firm's branches of activity. In Nos. 159 and 160, Shoreditch, are the general offices, with a well-equipped shop and showroom for builders' ironmongery and brass-foundry, also stockrooms for same. No. 161, Shoreditch, houses the gas and electric shop and showrooms. In the adjoining block, comprising Nos. 2, 3, 4 and 5, Anning-street, and Nos. 1, 2, 3, 4, 5, 6, 7 and 8, Bateman's row, are the showrooms and warehouses for stoves, ranges, tiled surrounds, baths, sanitary ware, heating and domestic hot water boilers, tools and machinery, also warehouses for castings, nails, etc. On the ground floor are the despatch and tile slabbing departments. In the rear is the ironyard, which adjoins the works department, the latter being equipped with forges and most modern engineering plant. Rolled steel joists, sheets and plates are housed in the arches close by. Here also is the latest addition in the offices housing the experts of the heating and ventilating department. Messrs. Clark, Hunt and Co., Ltd., issue a cordial invitation to all up-to-date architects and progressive contractors to visit the works, over which they will gladly be shown. It will constitute a visit full of interest.

Safety-Flame Lamps.

The Standing Committee appointed by the Board of Trade will hold their inquiry as to whether imported safety-flame lamps and parts thereof should bear an indication of origin, at 11.30 a.m. on Monday, April 23. If necessary, a further meeting will be held on Tuesday, April 24. The inquiry will be held at the Board of Trade offices, Great George Street, London, S.W.1. Communications should be addressed to Mr. E. W. Reardon, the Secretary of the Committee, at that address.

CURRENT PRICES FOR BUILDING WORK IN LONDON*

EXCAVATOR.

		s.	d.
Digging and throwing or wheeling and filling carts, and carting away to shoot—6 ft. deep	per yard cube	11	0
Add if in clay	,, ,,	1	0
Add for every additional depth of 6 ft.	,, ,,	0	6
Planking and strutting to trenches	per foot super	0	5
Do. to sides of excavation, including shoring	,, ,,	1	0

CONCRETOR.

		s.	d.
Portland cement concrete in foundation 1 to 6	per yard cube	38	0
Add if in underpinning in short lengths	,, ,,	7	0
Add if in floors 6 in. thick	,, ,,	3	3
Add if in beams	,, ,,	3	9
Add if aggregate 1 : 2 : 4	,, ,,	10	0
Add for hoisting not exceeding 10 ft. beyond the first 10 ft.	,, ,,	2	6

BRICKLAYER.

		£	s.	d.
Reduced brickwork in lime mortar and Fletton bricks	per rod	32	0	0
Add if in stocks	,,	7	10	0
Add if in Staffordshire blues	,,	22	0	0
Add if in Portland cement and sand	,,	1	10	0

FACINGS.

		s.	d.
Extra for facing in English or Flemish bond for every 10s. per 1,000 over the price of the common bricks	per ft. super	0	1½

POINTING.

		s.	d.
Neat flat struck or weathered joint	,, ,,	0	3

ARCHES.

		s.	d.
Extra only to the price of ordinary brickwork :—			
Fair external in half brick rings	,, ,,	0	10
Axed in stocks	,, ,,	1	9
Rubbed and gauged jointed in putty camber or segmental	,, ,,	6	0

SUNDRIES.

		s.	d.
Damp course in double course of slates breaking joint and bedded in Portland cement	,, ,,	1	0
Setting ordinary register grates and stoves	each	1	0
Setting kitchener, including forming flues, &c., with all necessary fire bricks	,,	15	0

ASPHALTER.

		s.	d.
Half-inch horizontal damp course	per yard super	4	6
Three-quarter-inch vertical damp course	,, ,,	9	6
Three-quarter-inch on flats in two thicknesses	,, ,,	6	3
Angle fillet	per foot run	0	3
Skirting and fillet 6 in. high	,, ,,	1	2

MASON.

		s.	d.
York stone templates fixed	per foot cube	13	0
York stone sills fixed	,, ,,	22	0
Bath stone and all labour fixed	,, ,,	10	6
Beer stone and all labour fixed	,, ,,	15	0
Portland stone fixed	,, ,,	20	0

SLATER.

		s.	d.
Welsh 16 in. × 8 in. 3 in. lap, including nails	per square	72	9
Do. 20 in. × 10 in. Do. Do.	,,	80	9
Do. 24 in. × 12 in. Do. Do.	,,	90	0

CARPENTER AND JOINER.

		s.	d.
Fir framed in plates	per foot cube	5	0
Do. joists	,, ,,	5	6
Do. roofs, floors and partitions	,, ,,	6	0
Do. trusses	,, ,,	8	6

		¾″	1″	1¼″	2″
Deal rough close boarding	per sq.	35/6	40/-	45/-	72/-

		s.	d.
Flat centering for concrete floor, including struts or hangers	,,	50	0
Do. to beams	per ft. sup.	0	11
Centre for arches	,,	1	6
Gutter boards and bearers	,,	1	0

FLOORING.

		¾″	1″	1¼″	1½″
Deal-edges shot	per sq.	—	44/6	53/-	60/6
Do. tongued and grooved	,,	—	49/-	57/6	65/-
Do. matchings	,,	45/-	51/-	—	—
Moulded skirting, including backings and grounds	per ft. sup.	1/6	1/9	2/-	2/6

SASHES AND FRAMES.

		s.	d.
One-and-a-half moulded sashes or casements	per foot super	1	10
Two Do. Do. Do.	,, ,,	2	1
Add for fitting and fixing	,, ,,	0	3
Deal-cased frames with 1 in. inner and outer linings, 1½ in. pulley stiles tongued to linings, hard wood sills with 2 in. moulded sashes in squares, double hung, double hung with pulleys, lines and weights; average size	,, ,,	3	9

DOORS.

		1¼″	1½″	2″
Two-panel square framed	per ft. sup.	2/1	2/4	2/6
Four-panel Do.	,,	2/5	2/8	2/11
Two-panel moulded both sides	,,	2/8	2/11	3/2
Four-panel Do. Do.	,,	2/11	3/2	3/5

CARPENTER AND JOINER—continued.

FRAMES.

		s.	d.
Deal wrot moulded and rebated	per foot cube	14	0

		1″	1¼″	1½″
Plain deal jamb linings framed	per ft. sup.	1/7	1/8	1/11
Deal shelves and bearers	,,	1/4	1/6	1/9
Add if cross-tongued	,,	2d.	2d.	2d.

STAIRCASES.

	1″	1¼″	1½″	2″	2½″
Deal treads and risers in and including rough brackets	2/1	2/4	2/9	—	—
Deal strings wrot on both sides and framed	1/8	2/-	2/2	2/8	—

		s.	d.
Housings for steps and risers	each	0	11
Deal balusters, 1 in. × 1¼ in.	per ft. run	0	9
Mahogany handrail : average, 3 in. × 3 in.	,, ,,	6	0
Add if ramped	,, ,,	12	0
Add if wreathed	,, ,,	24	0

FIXING ONLY IRONMONGERY (INCLUDING SCREWS).

6 in. barrel bolts	8½d.	Rim locks	2/-
Sash fasteners	11½d.	Mortice locks	4/8
Casement fasteners	1/5	Patent spring hinges and letting into floor and making good	19/-
Casement stays	1/2		
Cupboard locks	1/5		

FOUNDER AND SMITH.

		s.	d.
Rolled steel joists	per cwt.	16	3
Plain compound girders	,,	19	0
Do. stanchions	,,	21	9
In roof work	,,	27	6

RAIN-WATER GOODS.

		3″	4″	5″	6″
Half-round plain rebated joints	ft. run	1/6	1/9	2/-	2/6
Ogee Do. Do.	,,	1/9	2/-	2/6	3/3
Rain-water pipes with ears	,,	1/9	2/7	—	—
Extra for shoes and bends	each	4/4	5/11	—	—
Do. stopped ends	,,	1/11	2/4½	3/7	4/-
Do. nozzles for inlets	,,	2/2	2/7	3/10	4/3

PLUMBER.

		s.	d.
Milled lead and laying in flashings and gutters	per cwt.	41	6
Do. Do. in flats	,,	40	6
Extra labour and solder in coated cesspools	each	6	9
Welf joint	per ft. run	0	6
Soldered seam	,, ,,	1	3
Copper nailing	,, ,,	0	3

		½″	¾″	1″	1½″	2″	4″
Drawn lead waste	per ft. run	1/2	1/9	2/-	3/4	4/-	—
Do. service	,,	1/8	2/2	2/7	3/10	—	—
Do. soil	,,	—	—	—	—	—	6/9
Bends in lead pipe	each	—	—	—	—	3/3	8/2
Soldered stop ends	,,	1/2	1/8	2/1	2/10	3/6	—
Red lead joints	,,	11d.	1/-	1/3	1/11	2/4	4/10
Wiped soldered joints	,,	2/10	3/6	4/-	4/11	6/6	9/9
Lead traps and cleaning screws	,,	—	—	—	14/7	19/6	—
Bib cocks and joints	,,	6/4	9/7	15/4	41/-	—	—
Stop cocks and joints	,,	15/4	17/2	25/8	64/-	—	—

PLASTERER.

		s.	d.
Render, float and set in lime and hair	per yard. sup.	2	6
Do. Do. Sirapite	,, ,,	2	9
Do. Do. Keen's	,, ,,	4	0
Add saw lathing	,, ,,	1	7
Add metal lathing	,, ,,	2	6
(Not including hangers or runners, etc., for suspended ceilings.)			
Portland cement screed	,, ,,	2	2
Do. plain face	,, ,,	3	3
Mouldings in plaster	per 1 girth	0	1½
One-and-a-half granolithic pavings	per yard sup.	5	6

GLAZIER.

		s.	d.
21-oz. sheet plain	per foot sup.	0	8½
26-oz. Do.	,, ,,	1	0
Obscured sheet	,, ,,	1	1
⅛-in. rolled plate	,, ,,	0	9
¼-in. rough rolled or cast plate	,, ,,	0	10½
¼-in. wired cast plate	,, ,,	1	4

PAINTER

		s.	d.
Preparing and distempering, 2 coats	per yard sup.	0	9
Knotting and priming	,, ,,	0	7
Plain painting, 1 coat	,, ,,	0	9
Do. 2 coats	,, ,,	1	2
Do. 3 coats	,, ,,	1	9
Do. 4 coats	,, ,,	2	4
Graining	,, ,,	2	3
Varnishing twice	,, ,,	1	9
Sizing	,, ,,	0	3
Flatting	,, ,,	0	7
Enamel	,, ,,	1	1
Wax polishing	per foot sup.	0	6
French polishing	,, ,,	1	2
Preparing for and hanging paper	per piece, 2/- to 4/-		

* These prices apply to *new buildings only*. They cover superintendence by foreman and carry a profit of 10% on the prime cost without establishment charges. A percentage of 1½ should be added for Employers' Liability and National Health and Unemployments Acts and from 1s. 6d. per £100 for Fire Insurance. The whole of the information given on this page is copyright.

NEW COMPANIES

THE particulars quoted below have been compiled by Messrs. Jordan & Sons, Ltd., Company Registration Agents, of 116 & 117, Chancery-lane, W.C.2, from the documents available at the Companies Registry.

BROOKS HAYWOOD & CO., LTD. (227,251). Registered January 11. 7, Sheaf-street, Sheffield. Iron, steel and general merchants, etc. Nominal capital, £100.

BERRYS COMPOUNDS, LTD. (227,134). Registered January 6. Road contractors, paviors, manufacturers of and dealers in Berrys compounds, etc. Nominal capital, £1,000.

WILLIAM F. BAILEY (WORCESTER), LTD. (227,127). Registered January 5. 9, Silver-street, Worcester. Paint, glass, oil and colour merchant. Nominal capital, £10,000.

H. W. WENSELL, LTD. (227,083). Registered January 4. 357, Seven Sisters-road, N.15. Builder. Nominal capital, £1.000.

J. GARRETT & SON, LTD. (227,225). Registered January 9. Builder and public works contractor. Nominal capital, £20,000.

H. JAY & CO., LTD. (227,363). Registered January 16. 145, High-street, Wanstead. Builders' and general merchants and traders, etc. Nominal capital, £2,000.

GEORGE RICHARDSON (PRESTON), LTD. (227,387). Registered January 17. Builders and decorators, etc. Nominal capital, £1,500.

WILKINSONS (CONTRACTORS), LTD. (227,303). Registered January 13. Public works contractors, builders, engineers, etc. Nominal capital, £5,000.

ROCK HARD ENAMEL CO., LTD. (227,365). Registered January 16. 6-7, Tudor House, Walsall. Nominal capital, £1,000.

HOWARD MAY & CO., LTD. (227,287). Registered January 12. High-street, Old Southgate. Builders' merchants, etc. Nominal capital, £800.

GEO. W. FISHER, LTD. (227,209). Registered January 9. 21, Water-street, Liverpool. Builders' merchants, etc. Nominal capital, £500.

ROWSON & WADE, LTD. (227,352). Registered January 14. Builder, decorator and contractor. Nominal capital, £5,000.

SERVICE COMPOSITIONS, LTD. (227,270). Registered January 11. 92, Upper Richmond-road, Putney, S.W.15. Manufacturers of and dealers in paint and enamels, etc. Nominal capital, £100.

ARTHUR COOPER & SONS, LTD. (227,217). Registered January 9. Builder and contractor. Nominal capital, £2,000.

A. E. A. PROWTING, LTD. (227,073). Registered January 4. 1, West End Buildings, High-street, Ruislip. Builders and contractors, etc. Nominal capital, £5,000.

CWMLEYSHON LIME AND QUARRY CO., LTD. (227,111). Registered January 5. Cwmleyshon Quarry, Rudry, Glam. Quarry owners and stone merchants. Nominal capital, £3,000.

SHARPLESS & CO., LTD. (227,124). Registered January 5. 126, Grove Green-road, Leytonstone, E.11. General builders' merchants, etc. Nominal capital, £3,000.

W. LOXLEY, LTD. (227,711). Registered January 31. Lodge Hill Works, Lodge Hill, Selly Oak, Birmingham. Monumental sculptors. Nominal capital, £5,000.

W. E. WHITESIDE, LTD. (227,665). Registered January 28. 42, The Arches, Metropolitan Railway, South Harrow, Middlesex. Designer of ornamental and domestic metal work. Nominal capital, £2.000.

VENETIA, LTD. (227,664). Registered January 28. 14, York Mews North, Baker-street, W.1. Decorators, etc. Nominal capital, £25,000.

KELSEY HILL SAND AND GRAVEL CO., LTD. (227,681). Registered January 30. Hesslewood-rise, Hessle, E. Yorks. Nominal capital, £1,000.

RIVER DART SAND AND GRAVEL, CO., LTD. (227,424). Registered January 18. Nominal capital, £3,500.

SHAW'S BUILDINGS, LTD. (227,447). Registered January 19. Oxford House, 70, Oxford-street, Manchester. Builders and building contractors, etc. Nominal capital, £30,000.

TENDERS

Communications for insertion under this heading should be addressed to "The Editor," and must reach him next week not later than Tuesday evening.

* **Denotes *accepted*.**
† **Denotes *provisionally accepted*.**
‡ **Denotes *recommended for acceptance*.**
§ **Denotes *accepted subject to modifications*.**

Barrow-in-Furness.—Secondary school for boys, at Risedale Valley, for the Corporation :—
*Rainey Bros., Ltd., Barrow £26,158

Belfast.—Elementary school in Limestone-road, for the C.B. Education Architect, Victoria-street :—
*J. & R. W. Taggart, Belfast £27,500

Bishop's Stortford.—24 houses on the Dunmow-road housing estate, together with road and sewers, for the U.D.C. Mr. R. S. Scott, engineer and surveyor :—

Lawes, Cherry & Co., Ltd., London	£13,080 0
G. L. Thurgood & Son, Ltd., Much Hadham, Herts	11,990 0
Reed & Hoad, Harlow	11,853 12
Bennett Brothers, Letchworth	10,920 0
F. Cannon & Sons, Bishop's Stortford	10,467 3
E. Markwell, Bishop's Stortford	10,308 18
H. T. Brisley, Stratford-on-Avon	9,853 0
*A. Clark, Bishop's Stortford	9,066 0

Blackpool.—Four transformer sub-stations, one in Sheaf-street, Poulton, one in Breck-road, Poulton, one at Little Carleton railway crossing, and one at Castle-gardens, Great Carleton, for the C.B. :—
*H. B. Byram.

Bolton.—98 houses on west of Back Tonge, Moor-road, and 104 on south side of Paulham-street, for the Corporation. Mr. W. Russell Brown, Borough Surveyor :—
*Selwood, Lloyd & Co., Ltd., Birkenhead.

Bolton.—Extensive alterations and extensions to the Theatre Royal, for the Bolton Theatre and Entertainments Co., Ltd. Messrs. Wynne-Thomas & Button, architects, 14, Acresfield :—
*G. & J. Seddon, Ltd., Little Hulton.
Joinery—
*S. Porter, Bolton.
Plasterers—
*Goodalls, Manchester.
Plumbing—
*Slater & Russell, Ltd., Bolton
Slating—
*Wm. Altham, Bolton.
Steelwork—
*J. Booth & Sons, Bolton

Bournemouth. — For alterations to premises, Yelverton-road, Bournemouth, for Messrs. G. Lane & Co., Ltd., wine merchants. Messrs. Jackson & Greenen, architects and surveyors, Bournemouth :—

George & Harding	£4,747
Jenkins & Sons, Ltd.	4,565
W. E. Jones & Sons	4,550
Shears & Sons	4,345
*Jones & Seward, Ltd.	4,330

Burton-on-Trent.—49 houses at Winskill, for the C.B. Mr. G. T. Lynam, Borough Engineer and Surveyor :—
*T. Lowe & Sons, Ltd., Burton-on-Trent.

Cleveleys.—Premises in Victoria-road :—
*W. Eastwood, Cleveleys.

Clitheroe.—Retort house and installing a retort bench, for the Corporation. Mr. R. Barrett, Gas Engineer and Manager :—
Retort House—
*Drakes, Ltd., Ovenden.
Retort Bench—
*Aldridge & Ranken, Bath.

Cudworth.—Church on a site at White Cross-road, Cudworth, for trustees of the Primitive Methodist Church. Mr. H. Shelton, architect, Albert-street :—
*Oakland Bros., Ltd., Barnsley.

Cwmbran.—20 houses on the Penywain housing site, for the Llantarnam U.D.C. Mr. A. F. Viney, surveyor :—
*King & Co., Newport (Mon.) £7,112

Derby.—Houses, for the T.C. :—
32 type 8a houses—
*Bowring Brothers, Leicester £11,712
8 two bedroom type—
*Bowring Brothers, Leicester £2,453
20 type 8a houses—
*E. Morley & Sons, Ltd. £7,300
36 two bedroom type—
*E. Morley & Sons, Ltd. £10,260
18 type 8a houses—
*E. Morley & Sons, Ltd. £17,520
16 two bedroom type—
*E. Morley & Sons, Ltd. £4,560

Earby.—Church at Salterforth-lane, for the Rev. J. Holohan, St. Patrick's Church. Messrs. E. Simpson & Co., architects, Bradford :—
*Mullen & Durkin, Ltd., Burnley.

Epworth.—Reconstruction work to the roof of the Parish Church, for the Parochial Council :—
*Rudd & Son, Grantham £530

Farnham.—68 houses, for the U.D.C. :—
*Sherren, Ltd., Lewes £25,891

Falmouth.—Repair, also decoration of Wesley Church, The Moor. Mr. G. R. Phillips, hon. secretary of trustees, 15, Trevethan-road :—
*E. Geo. Newton, Hayle £450

Haslemere.—Extensions to the hospital, for the Management Committee :—
*Chapman, Lowry & Puttick £13,898

Kirkcaldy.—Electric lighting in proposed additions at the Aberhill school, for the Fife Education Authority. Mr. G. Sandilands, architect and master of works, Education Offices :—
*J. & C. Lamont, Kirkcaldy £116 12 11

Leeds.—Painting, etc., for the T.C. :—

Roundhay-park—	
*L. E. Wilkinson	£103 2
Potternewton-park—	
*L. E. Wilkinson	148 0
Cross Flatts-park—	
*W. Noddings	111 10
Middleton estate—	
*Leslie & Bond	203 0
*Pain & Smith	122 10
*Myers & Beckett	295 6
Cross Gates—	
*J. Cass	393 17
*J. T. Swann	120 15
Meanwood—	
*J. Wilson	209 4

Leeds.—Additions to "Carr Head," Roundhay, for Mr. C. Lupton. Mr. G. W. Atkinson, architect :—
*Wm. Gott & Son.

Leeds.—Various works for the T.C. :—

*Paul Rhodes, Ltd. (construction of reinforced concrete reservoir at Middleton)	£10,220
*George Depledge & Co., Ltd. (steel stages for water hardening plant)	£210 19 9
*J. Ferguson & Sons, Ltd. (foundations for pump at Headingley Pumping Station	£282 6

Leeds.—Construction of shop front and carrying out works in connection therewith, for the T.C. :—
*Blakey & Son £1,329 19

Leeds.—Warehouse at Ingram-road, for Messrs. Gallons, Ltd. Messrs. Chorley, Gribbon & Foggitt, architects :—
*Wm. Irwin & Co., Ltd.

Leeds.—Houses, for the T.C. :—
82 type A3 and 18 type B3 houses on the Meanwood housing estate—
*W. Thompson & Sons £36,658 7 0
62 type A2 houses on the Middleton housing estate—
*W. J. & R. Turnbull £18,693
56 type A3 and 56 type A2 houses on the York-road and Selby-road housing estate—
*W. J. & R. Turnbull £33,630
28 type A2 and 28 type A3 cottage flats on the York-road and Selby-road housing estate—
*W. J. & R. Turnbull £16,620 3

Lexden and Winstree.—Erection of cottages, together with fencing, paths, and a well, etc., at Marks Tey, for the R.D.C. Mr. E. Fincham, A.R.I.B.A., architect and surveyor, 4, Orsett-road, Grays :—

H. Allston & Son, W. Bergholt	£1,800 0
T. J. Smith, Colchester	1,562 0
A. French, Marks Tey	1,550 0
W. Chambers & Sons, Ltd., Colchester	1,547 0
A. Birkin & Sons, Coggeshall	1,545 0
E. Downes & Son, Ardleigh	1,535 0
T. H. R. Belchem, Kelvedon	1,532 15
A. E. Sparrow, Colchester	1,496 0
Scrutton & Son, Rowhedge	1,470 0
*W. H. Gooday & Co., Colchester	1,460 0

Longridge.—Improvements to the Forest Arms Hotel, Preston-road, for the Blackburn Brewery Co., Ltd. :—
*W. Houghton, Longridge.

Longridge.—Extensions to Stone Bridge Mills, for Messrs. George Whittle & Co. Mr. F. Dryden, consulting engineer, Grinshaw-street, Preston :—
*W. Houghton, Longridge.

New Longton.—Extensions to the Women's Institute, for the Committee :—
*H. Ovenden, New Longton.

Portsmouth.—Alterations, etc., at 30, St. Edward's-road, for Mr. A. Large. Mr. S. E. White, F.I.A.A., architect and surveyor, 73, Waverley-road, Southsea. Quantities by the architect :—

W. Curran & Sons, Southsea	£581 8 4
Howe & Bishop, Southsea	454 0 0
Tanner Bros., Southsea	428 0 0
*John Lay & Co., Portsmouth	410 0 0

Prestwich.—Super cinema on Bury New-road, for the Astoria Cinema, Ltd. Mr. A. Winstanley, architect, St. Annes-on-Sea :—
*C. O. Hallett, Stockport

Rochdale.—388 houses on the Nook Farm estate, for the Corporation. Mr. S. H. Morgan, Borough Surveyor :—
*H. Boots & Sons (London), Ltd., Sheffield

Rochdale.—Installations of electric lighting and power to 20 houses on Victoria-place site, for the C.B. Borough Surveyor :—
*F. Ludlow.

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St. Annes-on-Sea.—Branch stores at St. David's-road North, for the Blackpool Co-operative Society, Ltd. Mr. W. Wade, architect, Bank-chambers, Park-road :—

*H. Joyce & Sons, Ltd., St. Annes-on-Sea.

St. Faith's.—2 cottages at Morton, 4 Ringland, 2 Spixworth, 2 Weston, for the R.D.C. Messrs. A. F. Scott & Sons, FF.R.I.B.A., architects, 23, Tombland, Norwich :—

Morton—
*Rice Bros., Ltd., Bethel-street, Norwich £736 0 0
Ringland—
*Rice Bros., Ltd., Bethel-street, Norwich 1,472 0 0
Weston—
*Rice Bros., Ltd., Bethel-street, Norwich 736 0 0
Spixworth—
*Norgate Bros., Horstead 733 2 6

Scarborough.—Rebuilding premises in Newborough and St. Nicholas-street, for Messrs. Boots Cash Chemists, Ltd., Nottingham :—

*A. Moore & Son, Scarborough £20,000

Sheffield.—Houses on the Longley estate, for the T.C. :—

*J. Laver and Sons, Ltd. (14) £5,484
*Maxfield Bros. (32) 11,770
*Melling Bros., Ltd. (57) 20,142

Stockton Heath.—Improvements to the "Stag," for Messrs. Greenall Whitley & Co., Ltd., Wilderspool Brewery, Warrington :—

*C. W. Devonport & Sons, Stockton Heath.

Stonehaven.—Steel bridge across the Cowie at Ironfield-lane, to replace the wooden bridge, for the T.C. :—

Bridge—
*George Bisset & Sons, Aberdeen £240
Concrete Piers—
*W. G. Anderson, Aberdeen £185 10

Swansea.—60 houses on the Mayhill housing site, for the C.B. :—

Lloyd Bros., Swansea £27,280 0 0
Hawkins & James, Merthyr Tydfil 26,237 16 4
Daniel Phillips, Swansea 26,139 16 10½
A. L. Mansell, Sketty 25,808 15 0
Rhys J. Rees & Co., Ltd., Treforest 25,015 7 3
T. R. Cockwell & Sons, Port Talbot 24,528 11 8
C. Gustavus, Swansea 24,451 9 11
*Samuel & Evans, Swansea 21,306 12 4
E. J. Price, Carliff 20,741 7 8
Borough Architect's estimate ... 22,036 0 0

Walton-on-Thames.—New "Plough Inn" public house. Messrs. F. J. Fisher & Son, architects, 38, Bloomsbury-square, W.C.1 :—

*A. & B. Hanson, Southall.

Willesden.—277 houses, on the Neasden estate, for the U.D.C. :—

*Gee, Walker & Slater, London £106,412

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